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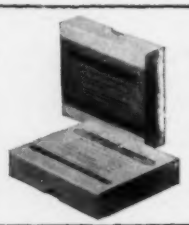

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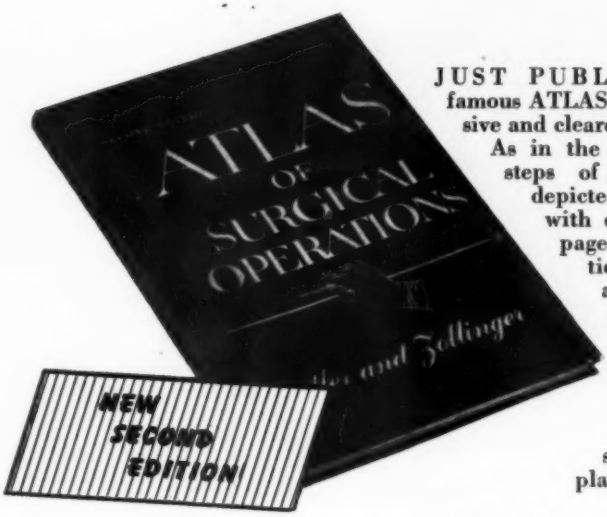

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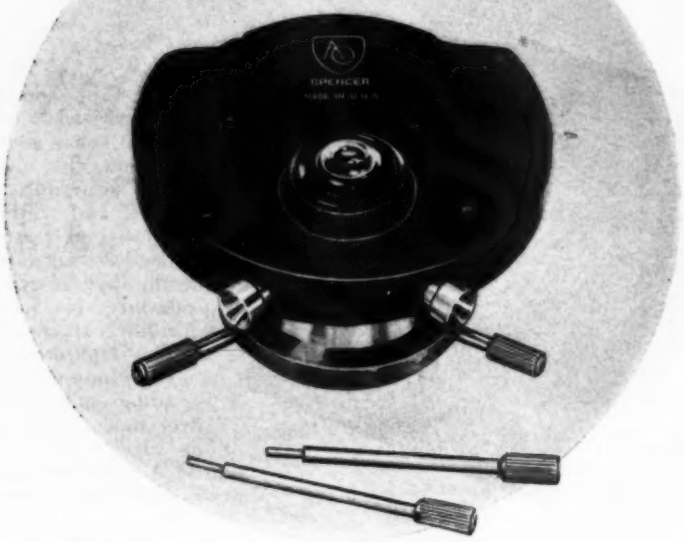

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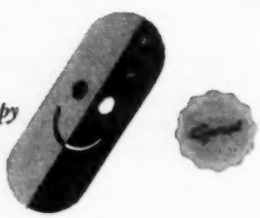

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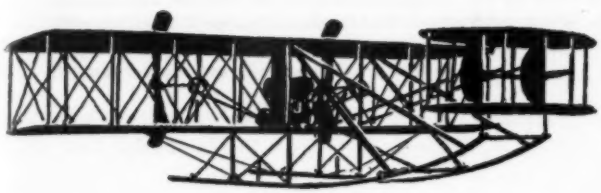

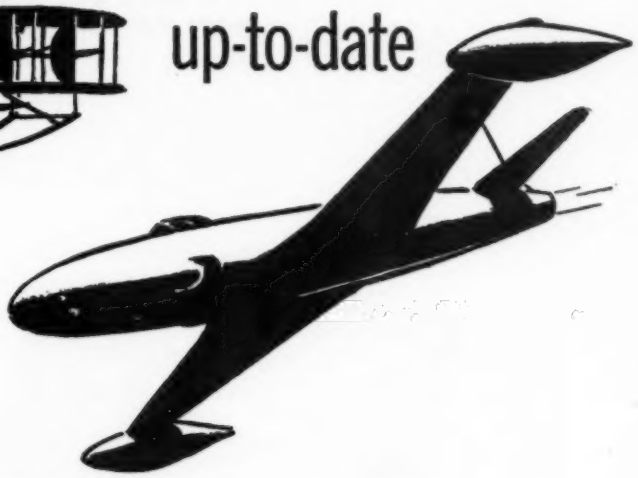

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Multi-vitamins are not alone the complete answer to protective nutrition. More and more, the mineral elements are being recognized as "spark plugs"—playing an all-important, if still unmeasured part in building and restoring body health. The catalytic-synergistic action of the minerals with the vitamins makes the difference in speeding up enzymatic processes on which the body is dependent for its functions.

Vi terra **contains all the vitamins known to be essential to human nutrition and, in addition, 12 minerals designed to act as catalysts in improved vitamin metabolism. Advance clinical reports indicate that when proper minerals are supplied with the necessary vitamins, the powerful activity of the enzymes present in the body is stimulated and increased.**

With Vi terra, the physician or surgeon can anticipate more rapid and potent effects than can be obtained with less complete formulations.

ALL IN ONE CAPSULE

VITAMINS		MINERALS	
Vitamin A *(Refined Fish Liver Oil)*	5,000 USP Units	Cobalt *(Cobaltous Sulf. .7 H_2O)*	0.1 mg.
Vitamin D *(Irradiated Ergosterol)*	500 USP Units	Copper *(Cupric Sulfate)*	1 mg.
Vitamin B_1 *(Thiamine Hydrochloride)*	3 mg.	Boron *(Sodium Metaborate)*	0.2 mg.
Vitamin B_2 *(Riboflavin)*	3 mg.	Iron *(Ferrous Sulfate)*	10 mg.
Vitamin B_6 *(Pyridoxine Hydrochloride)*	0.5 mg.	Iodine *(Potassium Iodide)*	0.15 mg.
Niacinamide	15 mg.	Calcium *(DiCalcium Phosphate)*	213 mg.
Vitamin C *(Ascorbic Acid)*	50 mg.	Manganese *(Manganous Sulf.)*	1 mg.
Calcium Pantothenate *(Dextro)*	5 mg.	Magnesium *(Magnesium Sulf.)*	6 mg.
Mixed Tocopherols Type IV	5 mg.	Molybdenum *(Sodium Molybdate)*	0.2 mg.
		Phosphorus *(DiCalcium Phosphate)*	165 mg.
		Potassium *(Potassium Sulf.)*	5 mg.
		Zinc *(Zinc Sulfate)*	1.2 mg.

DOSAGE: **Due to the catalytic-synergistic action of certain minerals with vitamins in vivo, it is suggested that one Vi terra capsule a day will serve adequately for supplementary nutrition. For quicker results three or more Vi terra capsules daily may be prescribed. Supplied in bottles of 100 capsules. You are invited to send for a clinical trial supply.**

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Some Facts on ERTRON®

STEROID COMPLEX—WHITTIER

—and Conclusions

1. FACT In combined series of 1,020 arthritic patients treated with Ertron, good results were obtained in 38.5%, fair results in 43.7% and poor results in 17.8%. Thus 82.2% of patients showed significant improvement. In addition, there were quickly evident heightened well being, increased strength and weight gain.

Conclusion The therapeutic effects of Ertron are not limited to the local manifestations of rheumatoid arthritis. The action is systemic, like the disease itself. Rapid alleviation of joint pain and stiffness along with improvement in the general condition make Ertron a valuable feature in the management of rheumatoid arthritis.

2. FACT Minor side effects, such as nausea, gastrointestinal upset, headache, etc., occur with Ertron as with many other valuable drugs. However, toxicity severe enough to warrant cessation of Ertron therapy occurred in only 1.4% of 1,020 arthritic patients. This incidence is low particularly when compared with the incidence of gold toxicity, which varies from 20% to 40%.

Conclusion Tolerance to Ertron is high. Treatment can be conducted without serious mishap if normal precautions are taken, i.e., administration of proper dosage and periodic observation of the patient. Side effects respond to temporary interruption of therapy or reduction of dosage, and usually do not recur when treatment is resumed.

ERTRON is supplied in bottles of 50, 100 and 500 capsules, and Ertron Parenteral in packages of six 1 cc. ampuls. Each capsule contains 5 milligrams of activation-products having antirachitic activity of fifty thousand U.S.P. units. Each ampul contains activation-products having antirachitic activity of five hundred thousand U.S.P. units, in sesame oil. Biologically standardized.

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Vitamin C (Ascorbic Acid)	75 mg.
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Vitamin B_2 (Riboflavin)	2 mg.
Vitamin B_6 (Pyridoxine Hydrochloride)	0.3 mg.
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Laryngoscope, Feb. 1935, Vol. XLV, No. 2, 149-154; Laryngoscope, Jan. 1937, Vol. XLVII, No. 1, 58-60; Proc. Soc. Exp. Biol. and Med., 1934, 32-241; N. Y. State Journ. Med., Vol. 35, 6-1-25, No. 11, 590-592.

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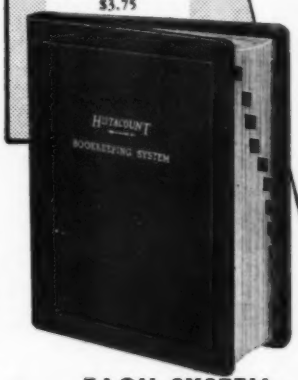

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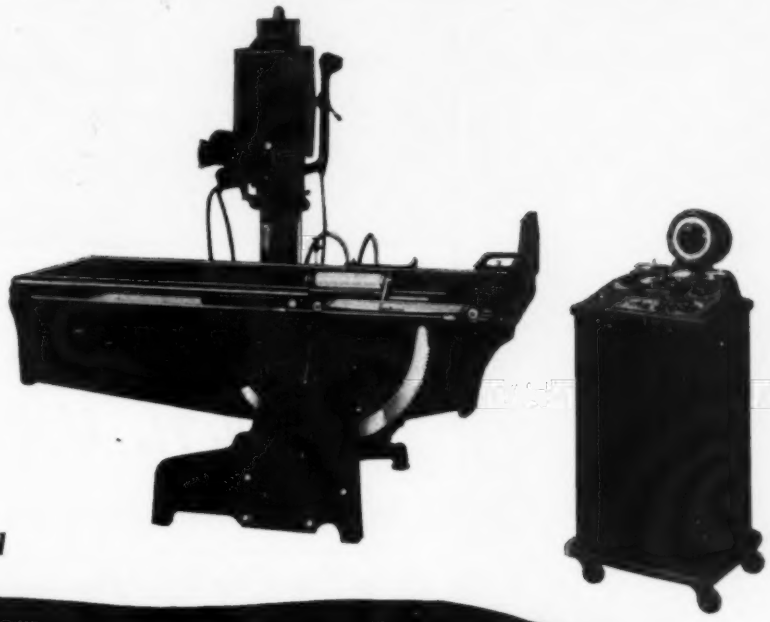

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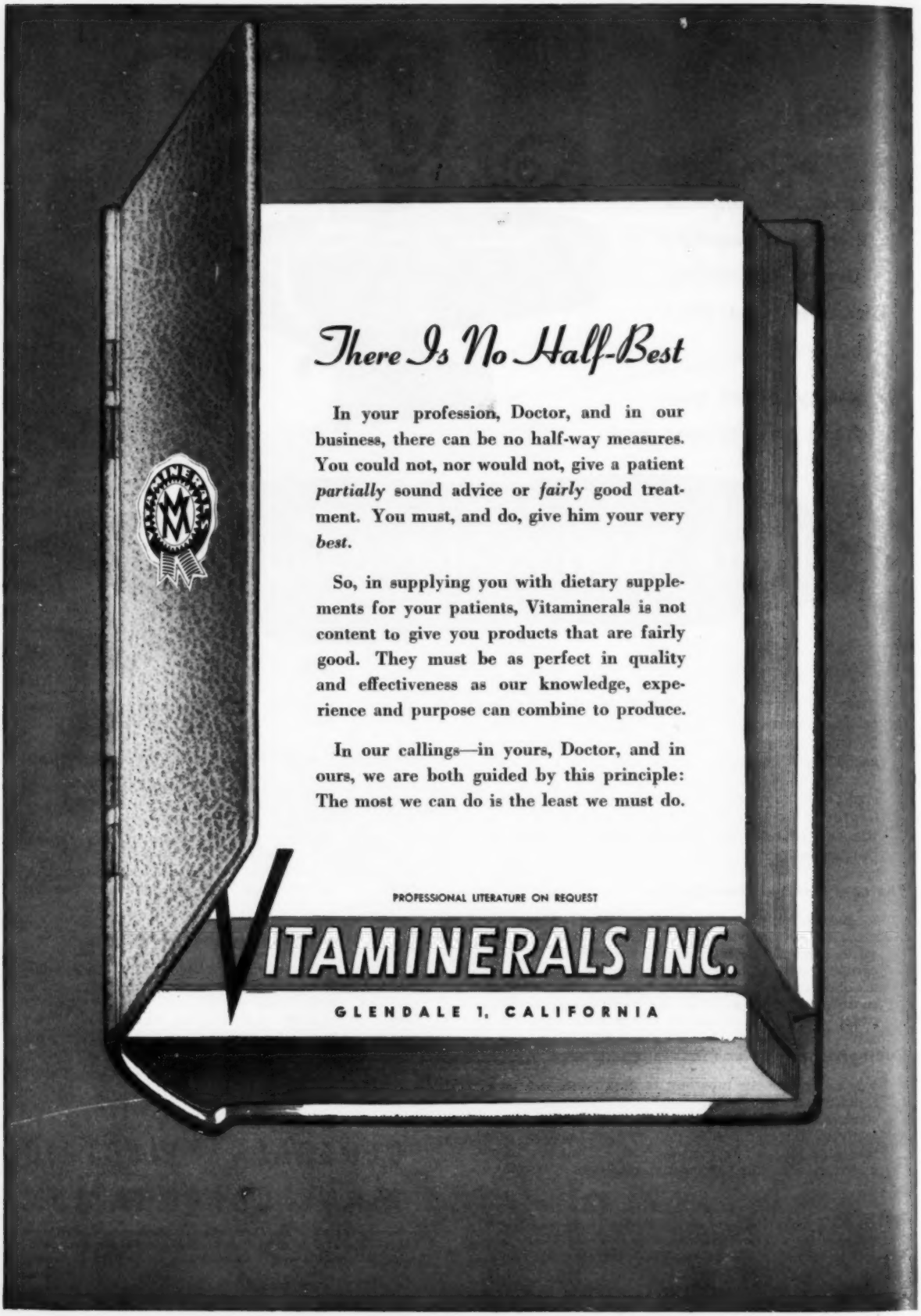
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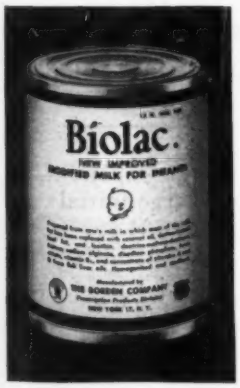

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1. Ricketts, W. A.; Carson, R. M., and Saeks, R. R.: Am. J. Obst. & Gynec. 56:955 (Nov.) 1948.

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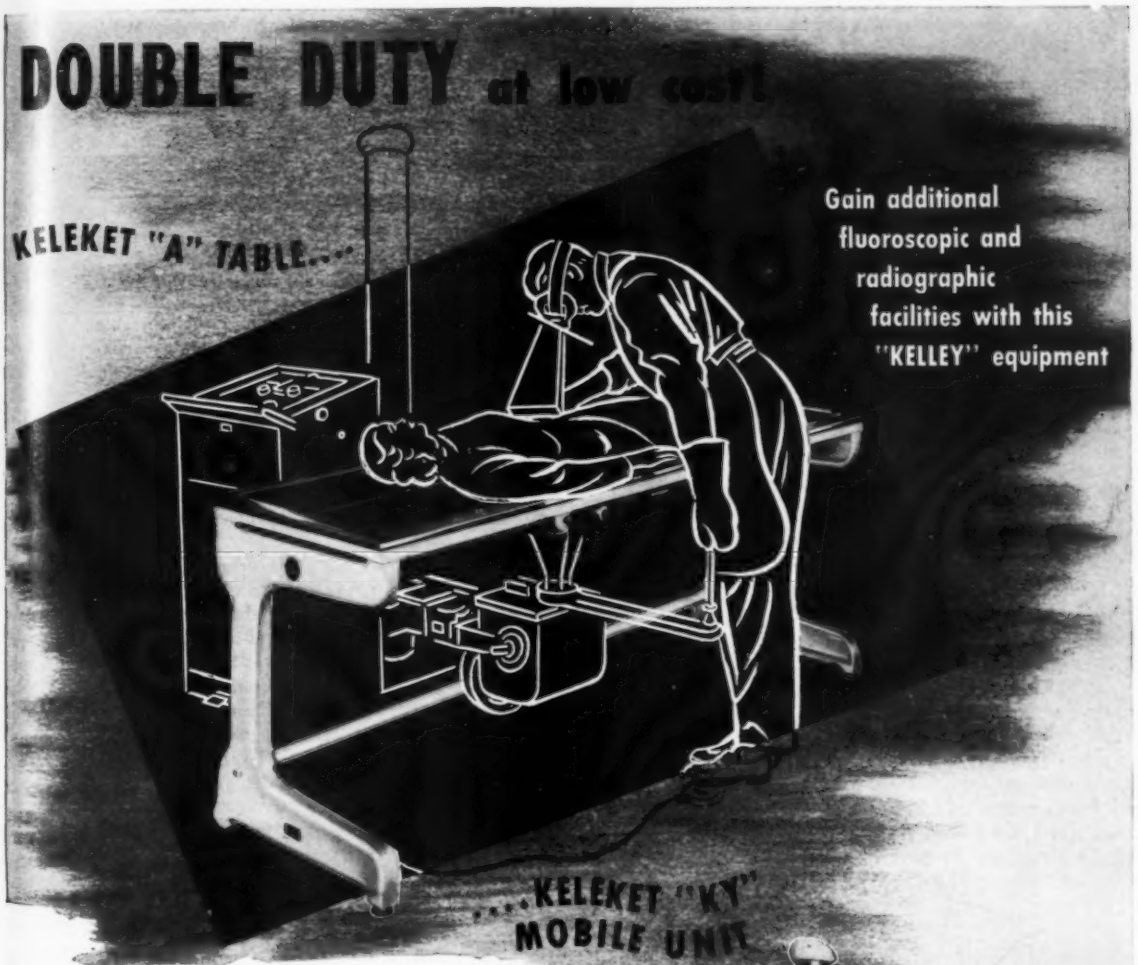
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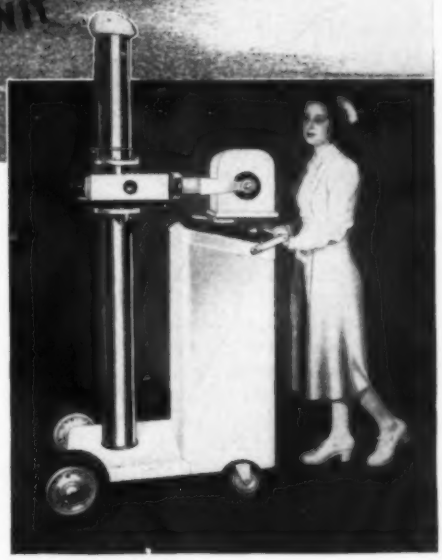

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The Osteopathic Lesion Complex*

VII. The Effects of the Experimental Osteopathic Lesion, Chemical Irritants in the Muscle at the Level of the Sixth Thoracic Segment, and Chemical Irritants in the Liver†

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Los Angeles

INTRODUCTION

In articles published previously[1-6] the effects of the osteopathic lesion have been described. These reports indicated that minor structural imbalances produced alterations in physiological activity. Later reports[7] have shown that experimental osteopathic lesions resulted in an alteration of the normal histological characteristics of some of the tissues examined.

The variations described did not reach the point of complete pathological degeneration but rather indicated that the tissues and organs reacted to a minor irritation through reflex activity and to a disturbance in the vascular supply as a result of an autonomic imbalance. Many early pathological responses depend entirely upon vascular alteration for their production and it has always been a part of the osteopathic philosophy that the maintenance of a normal functioning organism depends upon an intact blood supply. The importance of metabolic processes in the osteopathic concept is indicated by the fact that these processes are also dependent upon the maintenance of functionally normal vasculature and a normal flow of blood.

It was believed that by producing such a sequence of irritative reactions experimentally, they could be observed macroscopically and at the termination of the experiment it would be possible to demonstrate by histological methods exactly what had occurred. It was also felt that an attempt should be made to ascertain the possibility of a similarity existing between (1) an irritative substance in the paravertebral tissues, (2) a similar substance in a viscus, and (3) an experimental osteopathic lesion. This report is an attempt to describe the results of such a series of experiments.

MATERIALS AND METHODS

1. *Materials.*—Eight experimental animals were used with 2 controls in each of the experiments. The animals were of approximately the same age and of the same family. With the exception of variations necessitated by the experimental methods used on each group, the animals were maintained under identical environmental conditions.

The experiments continued for a period of 4 weeks. At the end of that period the animals were killed by the injection of 5 cc. of Nembutal sodium‡ into the marginal vein of the ear. Autopsy was begun as soon as the animal was under the influence of the anesthetic and the tissues to be examined were fixed in 10 per cent formalin solution in physiological saline.

The only organs removed for examination were the heart, liver, and kidney.

2. *Methods.*—

a. Chemical irritant in the liver: In this experiment Varisol§ and sodium morrhuate‖ were used. Before the experiment described herein was begun the reactions of the rabbit to these substances were ascertained by injecting 2.5 cc., 5 cc., 10 cc., and 15 cc. into the liver. An injection of 10 cc. was apt to prove fatal; therefore, 5 cc. was the amount chosen for use in the experimental procedure.

The material was injected directly into the liver by inserting the needle to the right of the midline on the anterior body wall immediately below the ribs. A hypodermic needle, 22 gauge and 2 cm. long, was used for the injection. It was essential to use a short needle as in some cases when long needles were used the solution was injected into the thoracic cavity and caused the death of the animal within 30 minutes.

b. Chemical irritant in the deep spinal muscles: The solutions used for injection into the liver were also employed in this experiment. For consistency, 5 cc. of the solution were injected deep into the muscle mass at the level of the sixth thoraeic segment. It should be mentioned that the solution did not remain

*This report was made possible by a grant from the Committee on Research of the American Osteopathic Association.

†This is the seventh report in a series on "The Osteopathic Lesion Complex." Five parts were published in the November, 1947; April, 1948; September, 1948; February, 1949; and April, 1949, issues of THE JOURNAL. A sixth part was published in the July, 1948, *Journal of Osteopathy*. The experiments reported herein were done in the laboratories of the Kirksville College of Osteopathy and Surgery, Kirksville, Mo.

‡Nembutal sodium (pentobarbital sodium) was obtained from the Abbott Laboratories.

§Varisol is composed of inert sugar (3 grams), sodium chloride (1 gram), benzyl carbinol (0.1 gram). The material was obtained from the Abbott Laboratories.

‖Sodium morrhuate was used in a 5 per cent solution and was obtained from the Ceplin Biological Laboratories, Syracuse, N. Y.

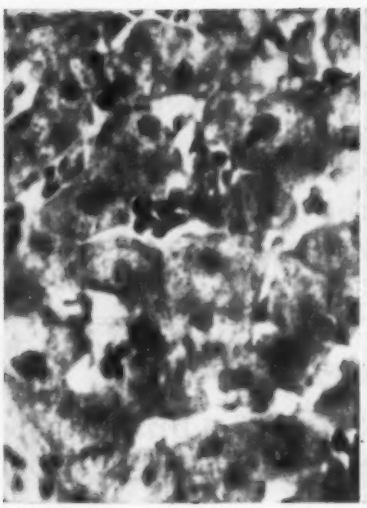

Fig. 1

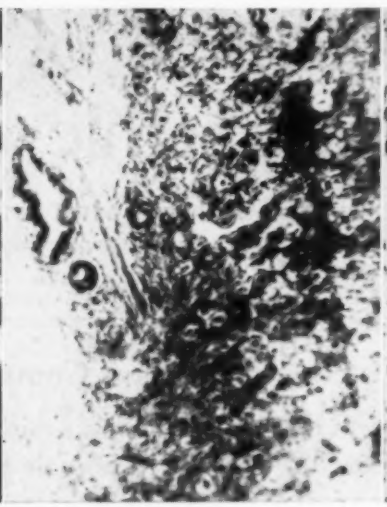

Fig. 2

Fig. 3

Fig. 1. Liver, × 450, gallocyanin and phyloxin. Experimental osteopathic lesion of 6 weeks' duration at the level of the sixth thoracic vertebra. Increased granularity of the liver cord cell and apparently swelling of the cytoplasm of some cells. Erythrocytes located in the spaces between the liver cord cells indicate some clumping. Fig. 2. Liver, × 160, gallocyanin and phyloxin. Injection of irritating substance into the paravertebral musculature at the level of the sixth thoracic vertebra. Granularity of cells evident and hemorrhage between the liver cords at the right side of the section. Fig. 3. Liver, × 160, gallocyanin and phyloxin. Section from the liver containing the irritating chemical. Section shows the limit of liver tissue and the region of fibrosis resulting from the irritation. Group of liver cord cells surrounded by connective tissue in the center of the photomicrograph. The magnification data given in these legends apply to the original photomicrographs, which were reduced about one fourth in reproduction.

confined to this segment but probably involved one or two segments above and below the site of injection.

c. Experimental osteopathic lesion: The osteopathic vertebral lesion was produced by the method of Burns[8] at the level of the sixth thoracic vertebra which consisted of manual pressure applied in the plane of vertebral motion at the level in which the lesion was to be produced. Little force was used as trauma was avoided as much as possible. The lesioning process was repeated at daily intervals until the muscular rigidity persisted. It was not necessary to repeat it more than five times.

3. *Histological methods.*—

a. Routine microscopy: Tissues were sectioned by the freezing method after a minimum period of fixation of 24 hours. The same cytoplasmic and nuclear stains were used as in the previous experiments of this series.[7] Gallocyanin was used as the nuclear stain and phyloxin as the cytoplasmic stain.

b. Phase contrast microscopy: Sections were prepared from fresh and frozen tissues by the freezing method and were mounted and sealed by a method previously described.[9]

c. Fat stains: This technic was used in an attempt to ascertain if there were evidences of fatty metamorphosis in any of the experimental procedures. The method was described by Mallory[10] and employs fixed frozen sections.

EXPERIMENTAL RESULTS

1. *Chemical Irritant in the Liver.*—

a. Gross examination: As was mentioned, two substances were used, but as the results were the same they will be described together.

The animals exhibited slightly different reactions following the injection of the material. Of the 8 experimental animals receiving the 5 cc. injections, 6 exhibited an extreme degree of nervousness and were startled by slight disturbances around them. This reaction lasted no more than 8 hours, after which the animals became apathetic and sluggish. The seventh became sluggish within 30 minutes after the injection. The eighth died within 8 hours following the injection, but its immediate reaction was similar to those of the first 6.

Palpatory examination revealed that the liver became hard and somewhat enlarged 2 to 3 days following the injection. The heart rate increased and became somewhat irregular in comparison to that of the controls and remained so until death. The respiratory rate was not altered appreciably.

Several days after the injection the paravertebral muscles between the fourth and eighth thoracic vertebral segments became rigid, as determined by palpatory examination, and in most cases seemed to be rigid to a greater degree on the right.

b. Autopsy examination: Examination revealed enlarged livers and in 4 instances a swelling was noted on the surface. Sectioning through this area showed proliferation of what appeared to be connective tissue. The livers of the experimental animals appeared somewhat redder than those of the controls but otherwise unaltered.

Hearts showed no gross differences from those of the controls.

The kidneys seemed to be slightly enlarged in comparison to those of the controls but no other alterations were noted.

c. Histological examination:

(1) The liver: Histological examination of the swollen area showed a small abscess formation and a considerable amount of fibroconnective tissue proliferation.

There were scattered small hemorrhagic areas with a considerable degree of congestion throughout the organ. Thrombi were noted in some sections. The glycogen distribution in the cytoplasm was abnormal and indicated activity of the liver cells.[11,12,13] The liver cord cells near the site of injection exhibited the greatest morphological alterations which were demonstrated best by the use of phase contrast observation. These changes were as follows: The cytoplasm of the liver cells was extremely granular and the nuclei were hyperchromic. The cells were swollen to the point that the sinusoids were almost obliterated. The changes were more extreme adjacent to the site of injection but were present throughout the organ. (See Figures 1, 2, and 3 for control and experimental sections.)

(2) The heart: Histopathological variations were not marked. The most obvious alteration in the sections was a congestive reaction in the coronary vessels. There were minor petechial hemorrhages between the muscle fibers.

(3) The kidneys: Histological sections exhibited the pathological picture of cloudy swelling.[14] The cytoplasm was swollen and the nuclei were dark-staining. In some cases the nuclei were somewhat enlarged in comparison to those of the controls. In many instances the cytoplasm was finely granular. In most instances the walls of the cells of the collecting ducts were indistinct, indicating that cloudy swelling was present.[12]

(4) The paravertebral muscles: Sections of the muscles from the experimental segments exhibited the picture of contracture. This was not extensive enough to be considered Zenker's degeneration but did exhibit the acidophilic properties and lack of cross striations indicative of beginning hyaline degeneration.[15]

2. *Chemical Irritant in the Paravertebral Muscle.*—

a. Gross examination: The immediate reaction of the experimental animal was irritability, especially when disturbed. However, with no abnormal stimulation the experimental animals did not exhibit any untoward symptoms. The group as a whole did not react to external stimulation similarly to the first group.

The paravertebral muscles from the fourth to the seventh thoracic vertebral segments were "boggy" at the site of the injection during the first 24 hours. Gradually the "boggy" feeling of the tissues was replaced by rigidity. The muscle masses were apparently tender as the animal attempted to avoid palpation.

The cardiac rate increased slightly as compared to that of the controls but not to the extent noted in the first experiment. The rhythm became somewhat erratic after the first 36 hours.

b. Autopsy examination:

(1) The liver was apparently slightly congested as it was redder than those of the control animals. No other alterations were noted.

(2) The heart showed no differences from those of the controls.

(3) The kidneys showed no variation from those of the controls.

(4) The paravertebral muscles: The muscle masses were removed between the fourth and seventh thoracic segments on both sides. The muscles were hyperemic and swollen bilaterally, but to a greater degree on the right.

c. Histological examination:

(1) The liver: Granularity of the cytoplasm was apparent by routine staining methods and also by phase contrast observation. This was a generalized reaction found throughout all sections examined. The nuclei exhibited a hyperchromic staining reaction and there was a slight congestion in the blood vessels.

The fat stain failed to reveal any amount of fatty metamorphosis in the liver cord cells but did stain the granules of the cytoplasm.

(2) The heart: There was no alteration in the staining characteristics of the cardiac muscle fibers. There were perivascular hemorrhages together with some congestion of the blood vessels.

(3) The kidneys: The cells of the collected tubules exhibited a degree of cloudy swelling but not to the extent that was observed in the previous experiment. The fat stain did not reveal any degree of fatty metamorphosis.

(4) The paravertebral muscles exhibited the histological picture of contracture. There were petechial hemorrhages between the muscle fibers and there were evidences of Zenker's hyaline degeneration—the acidophilic staining reaction and the lack of cross striations when stained by routine methods.

3. *The Experimental Osteopathic Lesion.*—

a. Gross examination: There was no immediate reaction to the production of the osteopathic lesion. However, after the experiment had been in progress for 6 or 8 days the animals became sluggish and unresponsive in comparison to the controls.

The cardiac rate was faster in the experimental animals than it was in the controls, but in only 3 animals was the rhythm irregular. Otherwise, the animals remained unchanged until the experiment was terminated, with the exception of the ropiness or rigidity of the paravertebral muscle mass which was noted 3 days following the first lesioning process. No conclusions as to degree of alteration on the right side as compared to that on the left were attempted.

b. Autopsy examination: The autopsy examination did not reveal remarkable changes.

(1) The liver was somewhat congested and perhaps slightly enlarged when compared to that of the controls. No other pathological signs were noted.

(2) The heart did not present any variations from those of the control animals.

(3) The kidneys: There were no apparent changes.

(4) The paravertebral muscles were hyperemic when compared to those of the controls but no other visible alterations were present.

c. Histological examination:

(1) The liver: The cord cells exhibited an extreme degree of granularity and evidences of hyperemia and congestion of the blood vessels supplying the parenchyma. The changes were not so great as those observed in the first experiment.

(2) The heart: There were indications of perivascular hemorrhages in the sections. In some instances erythrocytes were observed between the cardiac muscle fibers but there was no alteration in the staining characteristics of the muscle fibers themselves.

(3) The kidneys: Cloudy swelling and congestion were noted in routinely stained sections but were demonstrated better when observed by the phase contrast microscope. No vascular phenomena were

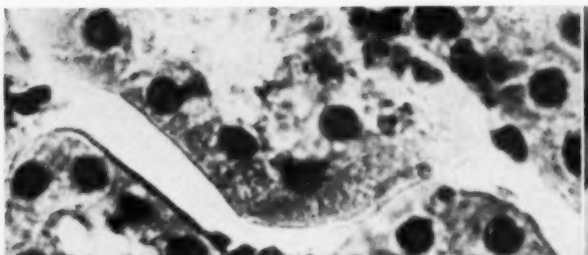

Fig. 4

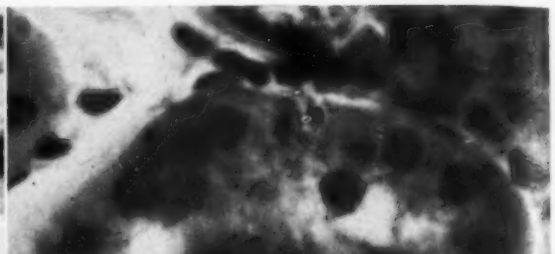

Fig. 5

Fig. 4. Kidney collecting tubule, × 450, gallocyanin and phyloxin. Control section. Fig. 5. Kidney collecting tubule, × 450, gallocyanin and phyloxin. Section from the experimental animal receiving the injection into the liver. Note the evidences of albuminous degeneration.

noted. (See Figures 4 and 5 for control and experimental sections.)

(4) The paravertebral muscles: Hyperemia and congestion were present. The histological picture was similar to that reported in the first two experiments, but not to the extent noted following the injection of chemical irritants into the muscle groups. The muscle fibers showed condensations of the sarcoplasm which indicates that contracture was present. There were no other indications of variation in the muscle fibers.

EXPERIMENTAL CONCLUSIONS

1. The injection of certain chemical irritants into the liver produced pathological variations in that organ. The reaction of the tissues was characterized by the cardinal signs of inflammation (irritation) together with abscess formation.

2. Injection of the same substances into the paravertebral musculature resulted in an irritative reaction in the muscles similar to inflammation but without abscess formation.

3. The effects of the intrahepatic injections were not localized in the liver but were manifested in other organs examined—the heart and kidneys—and also by the production of paravertebral muscular rigidity, probably the result of reflex activity.

4. The effects of the intramuscular injections were not localized in the paravertebral tissues but were reflected in the heart, kidneys, and liver. It was assumed that the only possible mechanism that could produce these variations would involve the autonomic nervous system.

5. The experimental osteopathic lesion produced changes similar to those observed following the injection of the chemical irritant into the paravertebral muscle groups. The effects of the osteopathic lesion on the muscle groups were not as remarkable as those following the injection of the chemical irritant but the reactions were similar in the two experiments.

6. As there was a similarity of reactions in the three experiments, it seems reasonable to assume that similar neural mechanisms were involved. From the experimental evidence it would seem reasonable to state that the experimental osteopathic lesion is an irritative focus which through neural mechanisms can affect the functional activity of visceral structures directly connected through the central or autonomic nervous systems. These reactions are not limited to the segmental connections of the central nervous system but rather affect the autonomic divisions and, therefore, the effects may be widespread.

DISCUSSION

Although the three experimental procedures reported herein may seem somewhat unrelated there is a common factor present—the visceral structures examined receive their autonomic (sympathetic) innervation from the same vertebral segments. The heart receives fibers originating in the fourth or fifth thoracic segments which form in part the cardiac plexus and stimulation of these fibers results in acceleration of the heart rate and vasoconstriction of the coronary vessels. The liver receives sympathetic fibers from the fifth to the ninth thoracic segments and stimulation of this innervation results in vasomotor activity of the vasculature of the parenchyma. The kidney receives its sympathetic supply from the ninth to the twelfth thoracic segments. Such innervation excludes the possibility of a single segmental effect. On the other hand, if one portion of the autonomic nervous system is stimulated by any physiological reaction, other parts are also affected.

It was not possible to confine the paravertebral reactions to one or two segments in any of the experiments. For example, in the production of the experimental osteopathic lesion the intent was to involve only the sixth vertebral segment; however, paravertebral muscular rigidity was observed two or three segments above and below the experimental segment. A similar response was observed following the injection of the chemical irritant into the paravertebral tissues. The reactions were not confined to one segment but extended above and below the site of injection. Furthermore, the paravertebral muscular rigidity resulting from the chemical irritant injected into the liver was not limited to a single segment of the vertebral column but involved several—the segments from which the autonomic innervation arises.

The experiment in which the chemical irritant was injected into the liver resulted in a typical physiological reaction to irritation or inflammation.

The orderly cytological sequence in the development of an inflammatory reaction following bacterial and mechanical irritations was first described by Borrel[16] and Durham.[17] Because of its importance to the present experiment it will be described briefly. Essentially the manifestation of inflammation tends to develop along uniform patterns irrespective of the irritant. Foreign substances, whether viable or nonviable, in contact with otherwise normal tissues will induce such a response. The intensity of the reaction may vary from barely visible hyperemia to an intense suppurative process. Therefore, inflammation may be broadly defined as the complex vascular, lymphatic, and local tissue reaction elicited in the higher animals by the presence of irritants. It represents a basic elemental reaction whereby the deleterious agent tends to be localized and overcome by the body defenses.[18,19]

It is logical to assume that the injection of a chemical irritant such as sodium morrhuate would produce an inflammatory reaction, and according to the definition as stated above the experimental osteopathic lesion would also be considered as a mechanical source of such an inflammatory reaction. The cellular reactions observed following the production of an experimental osteopathic vertebral lesion in this and previous experiments[7,20,21] indicate that this is true.

The changes include variations in the size of the capillaries and other blood vessels, the migration of leukocytes, the production of phagocytosis, and an attempt to wall off the foreign substance. It has been demonstrated that inflammatory agents not only call forth a cellular response but also a slight degree of disturbance in the hydrogen ion concentration of the involved tissue; evidence is indicative rather than conclusive.[22]

In the present experiment it was observed that the paravertebral muscles associated with the liver, into which the irritant had been injected, were rigid and similar to those into which the chemical irritant had been injected directly, and were also similar to those in which the experimental osteopathic vertebral lesion had been produced. The mechanism producing such an alteration probably was based on an autonomic reaction as there are no other mechanisms that are common to all the structures involved. The innervation (sympathetic) to the organs examined in the present investigations arises from the fourth to the twelfth thoracic segments, and it was between the fourth and tenth thoracic segments that the paravertebral muscular rigidity was noted. Due to the close central connections in the spinal cord it is possible to explain the presence of the muscular rigidity on the basis that stimulation arising from the irritated viscus produces an irritation that manifests itself in muscular contracture.

A similar mechanism may serve to explain the histopathological variations observed in the heart and kidneys, which were not as extensive as in the liver. It was demonstrated by Cannon[23,24] and Sokowin[25] that pathology in one viscus probably would affect other viscera in close autonomic segmental relationship. This phenomenon would explain the reactions observed in the present experiment.

The maintenance of contracture of the paravertebral musculature was probably due to reflex mechanisms; the irritation was present either as a mechanical disturbance in function or visceral irritation. It has been asserted that reflexes caused by stimuli which arise in viscera will be expressed in skeletal structures, especially in striated muscle segmentally related.[26] It is, therefore, not difficult to draw a parallel between the experiment in which chemical irritants injected into the viscera produced histopathological changes in other viscera and paravertebral contracture and the experimental production of contracture in musculature with subsequent visceral disturbance. The only difference was in the site of irritation; the same reflex mechanisms were involved.

The explanation of similarity between these experiments and the production of the experimental osteopathic lesion is slightly more difficult because a different type of irritation was used. Although no chemical irritants were introduced into the tissue the results were similar. It has been assumed by osteopathic physicians that the osteopathic vertebral lesion is a source of irritation, and that its presence produces tissue reaction and altered physiology in visceral structures. As has been mentioned in the discussion, the type of irritation is apparently immaterial in calling forth similar tissue responses. It would seem probable then that the mechanical osteopathic lesion becomes a source of irritation which can affect the functional capacity of visceral structures that are reflexly associated with it and that it is possible to liken the reactions of the three experiments to each other.

It was mentioned in the description of the production of the lesion that a certain amount of trauma was introduced into the tissues at the time the lesion was produced. This need not be considered in the evaluation of results because more than 3 weeks elapsed between the time the last lesioning process was performed and the time of autopsy. It seems likely that any trauma produced at lesioning would have been overcome by the natural body reparative processes by the time of autopsy.

Thus far the mechanism by which the paravertebral contracture was produced and maintained has been referred to only as a consistent finding with no explanation of the mechanisms involved. The contracture and hyperemia of the paravertebral muscles are probably parasympathetic responses and are transmitted from the site of irritation (either muscular or visceral) to centers in the brain stem by afferent spinal pathways.[27,28] When nerve endings in the musculature are stimulated, regardless of the type of stimulation, their afferent fibers synapse with cells of the mediolateral cell groups of the spinal cord, afferent impulses are then transmitted to the hypothalamus and dorsal nucleus of the vagus which produces parasympathetic activity in the musculature and even in visceral structures. It is probable that such a mechanism was called into activity in all three of the experiments described herein.

SUMMARY

The introduction of a chemical irritant into the paravertebral musculature does not simulate osteopathic etiological factors but offers a method for qualitative evaluation and comparison of the effects of the structural vertebral lesion. The effects were due to the presence of the chemical foreign substance, while the experimental osteopathic lesion represents a structural abnormality. The general reactions of the sympathetic division of the nervous system to both stimuli were acceleration of the heart rate, augmentation of the force of cardiac contraction, and production of dilatation of the coronary vessels. In the liver and kidney

there was vasoconstriction which was primary to the cellular alterations.

Experimental evidence indicates that the injection of chemical irritants in either the liver or paravertebral musculature results in disturbance in the balance of the autonomic nervous system with sympathetic predominance. It was observed that the experimental osteopathic lesion of the level of the sixth thoracic segment produced a like response. It should not be assumed that there is any similarity except that similar neural mechanisms are involved. The results of this and previous experiments indicate that experimental osteopathic vertebral lesions produce visceral alterations, both morphological and functional.

PRACTICAL APPLICATIONS OF EXPERIMENTAL RESULTS

The question may be asked concerning the application or importance of such an experiment to clinical osteopathy. There has been a great deal of investigative work reported concerning the alterations produced by vertebral lesions and in some instances there has been an attempt to apply these findings to the practice of osteopathy. It seems advisable in concluding the present experiment to mention a few indications as to how the results of experimental procedures may be utilized.

It is difficult to compare the reactions of laboratory animals to those of patients, yet biological reactions in mammals will follow the same general plan. The symptoms and diagnoses of visceral pathologies have been completely described in textbooks, but the osteopathic physician has more than the routine methods for diagnosis and treatment because palpatory findings in the paravertebral musculature indicate the presence of disease and the elimination of these areas by osteopathic manipulative methods has proved to be beneficial from the clinical standpoint.

There are two possible etiological factors in the production of an osteopathic vertebral lesion. The first is that such a lesion is the result of structural alterations,[29] and the second, that the osteopathic vertebral lesion is the product of altered visceral function due to a reflex of irritation.[30] It has been stated that the disturbed function of the stomach results in areas of tenderness in the region of the fifth, sixth, and seventh thoracic segments posteriorly.[31] It is probable that both etiological factors are involved in maintaining the osteopathic lesion complex, and from the therapeutic standpoint the importance of such a vertebral lesion is that it must be eliminated in order to normalize autonomic and segmental reflexes.

An irritation, bacterial, chemical, or mechanical, that is sufficient to overcome the body defenses is a potential cause of disease. Such an alteration will affect visceral function which in turn will be reflected in the paravertebral muscles as the osteopathic vertebral lesion. The originality of the osteopathic viewpoint of disease does not lie in a different conception of disease processes as much as it does in a different interpretation of the effects of pathological and functional alterations and the concept of treatment of disease. It is an accepted fact that osteopathic vertebral lesions are important contributing factors to many pathological alterations. Visceral alterations have a tendency to produce certain reflex symptoms that are well established.[7,31] On the other hand bacterial infections do not have such definite reflex patterns, but when they involve viscera, the reflex patterns are established for the particular viscus that may be involved, with the result that secondary oseopathic vertebral lesions are sometimes produced.

The osteopathic spinal lesion then becomes a part of any disease process and in itself is a source of irritation with a tendency to maintain itself and thus become a constant entity. The relationship of the paravertebral structures is intimate (Fig. 6) and because of the relationship of the various parts of the central and autonomic nervous systems, the irritation emanating from the osteopathic spinal lesion may be widespread.

Not only are the connections anatomically close centrally but also the peripheral portions of the autonomic system are closely related. The viscerovisceral reflex is demonstrated in Figure 7 and it can be seen

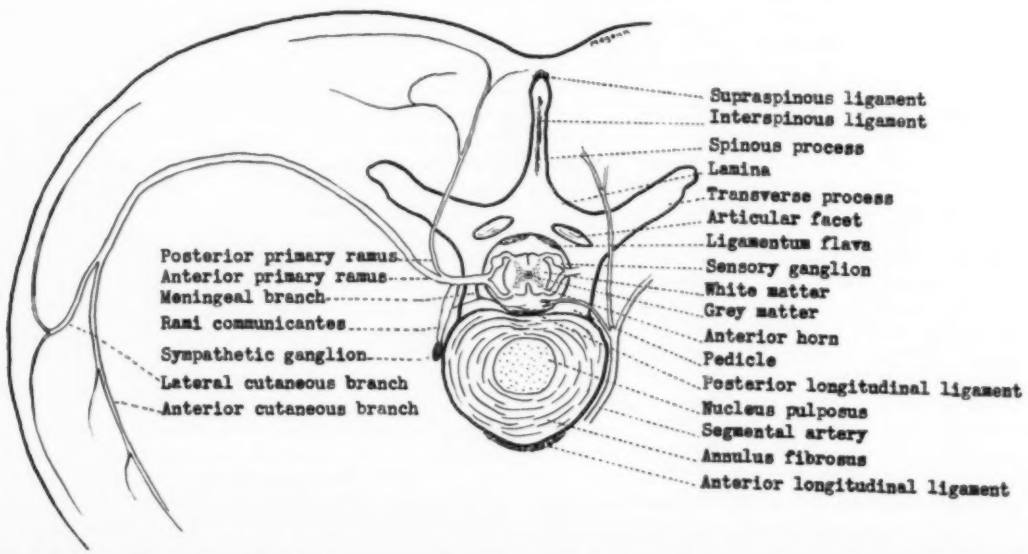

Fig. 6. Diagrammatic representation of a cross section of the spinal segment. The relationship between the dorsal musculature and the central and autonomic nervous systems is indicated.

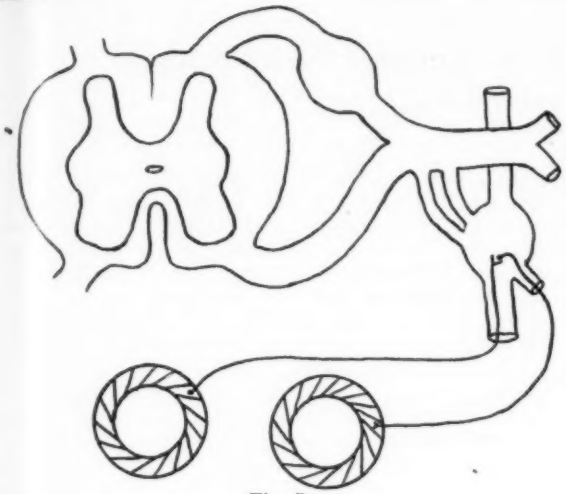

Fig. 7

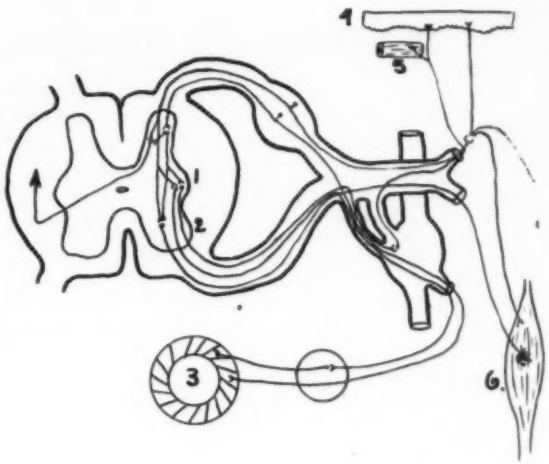

Fig. 8

Fig. 7. Diagrammatic representation of the viscerovisceral reflex arc. The neural connections via the autonomic nervous system are indicated between one viscus and another. Fig. 8. Schematic representation of the possible neural connections involved in the osteopathic lesion: (1) mediolaterial autonomic cells, (2) anterior horn of the spinal cord, (3) viscus, (4) skin over the paravertebral musculature, (5) blood vessels of the dorsal musculature, (6) muscles of posterior and anterior body walls.

that irritation in a viscus may be reflexly transferred to adjacent viscera as none of these structures function independently of one another. Figure 8 indicates the close relationship of the central and the autonomic nervous systems and also the involvement of paravertebral muscles following visceral alteration.

CONCLUSION

This series of experiments constitutes an attempt to demonstrate the effects of the experimental osteopathic spinal lesion in a laboratory animal, together with a comparison of this entity with a known irritation. The only value of such experiments is to indicate the potentialities of the osteopathic spinal lesion as an etiological factor in the production of disease and that its removal will tend to permit the tissues to recover. It is not to be assumed that correction or elimination of the osteopathic spinal lesion will correct visceral pathology or act as a bactericide; however, the normalization of the spinal area will permit the normal circulation of blood to a diseased viscus which aids the organism in re-establishing the normal functional activity and assists the natural reparative processes of the body.

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The Osteopathic Management of Anterior Metatarsalgia*

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DESCRIPTION

Anterior metatarsalgia was first described by T. G. Morton[1] of the University of Pennsylvania in 1876. It has also been called Morton's toe and external plantar neuritis. The condition is characterized by sudden, recurrent cramplike pain in the fourth toe and fourth metatarsophalangeal articulation, with numbness and burning between attacks. The pain usually remains localized but may involve the second, third, or fifth toe, or may radiate up the foot and leg. It is typically unilateral, occurs more frequently in the right foot, and is almost exclusively found in females. It occurs more frequently in the cavus type of foot with a high longitudinal arch and shortened Achilles tendon. This type of foot has been referred to as a throwback to the arboreal foot. Metatarsus primus varus is often associated with it.

In the beginning stages, the patient notices a burning or tingling sensation in the fourth toe and in the region of the head of the fourth metatarsal bone. There may be intermittent numbness with a sensation that the fourth toe is cramped. Gradually, intermittent attacks of pain occur, associated with a feeling that the head of the fourth metatarsal bone has dropped. These attacks of pain first occur while the patient is walking on the street. The patient will describe it as a "painful cramp" of the toe. Between these attacks, the toe feels numb and "tight." Crossing the affected leg over the normal leg while sitting will increase the numbness and may precipitate an attack.

The attacks gradually become more severe and of longer duration. The patient soon has to remove the shoe and rub the toe and foot to obtain relief. She soon learns that by compressing the metatarsals, arching the forepart of the foot, she can relieve the pain. It is not an unusual sight to see a woman stop in the middle of the street, remove her shoe, and, oblivious to her surroundings, rub and squeeze her foot before she can proceed. These attacks may be so severe that they cause nausea and syncope.

ETIOLOGY

Several men have attempted an explanation of the etiology of this condition. T. G. Morton,[1] who first described it, said it was due to compression of the fourth interdigital nerve as it passes between the metatarsal heads. Schuster[2] attributes it mainly to lateral compression of the forefoot, forcing the head of the fifth metatarsal inward and behind the head of the fourth, thus causing pressure on the large superficial branch of the lateral plantar nerve which lies between the heads of these two bones. Dickson and Diveley[3] believe it is caused by a depression of the "anterior metatarsal arch," compressing the digital nerves between the metatarsal heads and the ground. D. J. Morton[4] gives as the cause an irritation of the medial plantar nerve, due to arthritic changes between the first and second metatarsal bases and the first and second cuneiform bones, due to congenital shortness of the first metatarsal bone, with weakness and strain at its base. He believes the inflammation at this point spreads to the medial plantar nerve which passes under this area, sending a branch to the fourth toe and a communicating branch to the lateral plantar nerve (Fig. 1). Hiss[5] says the cause is a downward and inward displacement of the cuboid bone causing pressure irritation on the lateral plantar nerve. L. O. Betts[6] attributes the condition to a fibroneuroma of the fourth interdigital nerve resulting from traumatic neuritis. He excises the neuroma together with a length of the nerve and claims complete, permanent cure. It would seem probable that this would relieve the pain because removing a portion of the sensory nerve would block pain sensation. McElvenny[7] believed Morton's toe was caused by a tumor (neurofibroma or angioneurofibroma) involving the most lateral branch of the medial plantar nerve and advised excision.

The writer believes that all of these factors may be contributing causes. If the traumatic irritation of either the medial or lateral plantar nerves or their branches is maintained over some period of time it would be possible that a neuroma might form and would require removal. However, most of the conditions described (Morton syndrome,† displacement of the cuboid, cavus type of foot, et cetera) are usually found in *both feet*. Yet the pain of anterior metatarsalgia is characteristically *unilateral*. It, therefore, seemed logical to the writer that the primary cause had not been found. In accordance with A. T. Still's philosophy[8] that the lower limb is divided into five parts (foot, leg, thigh, pelvis, and lumbar region), a search was made for an irritating factor that would

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†To prevent confusion of terms it should be remembered that the Morton syndrome was described by D. J. Morton, whereas Morton's metatarsalgia or anterior metatarsalgia was described by T. G. Morton.

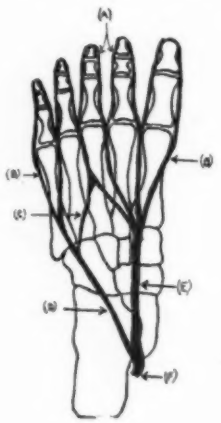

Fig. 1

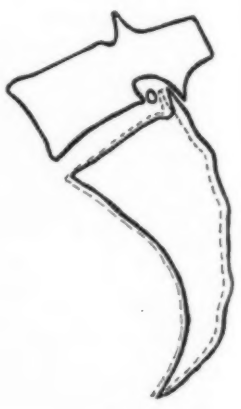

Fig. 2

Fig. 1. The plantar nerves: (A) interdigital branches, (B) proper digital nerves, (C) communicating branch from lateral plantar nerve to medial plantar nerve, (D) lateral plantar nerve, (E) medial plantar nerve, and (F) tibial nerve. Fig. 2. Diagram to show encroachment of foramen in a left rotation sacrolumbar lesion. Sacrum is rotated in a clockwise direction. Dotted line shows position assumed by lesioned sacrum.

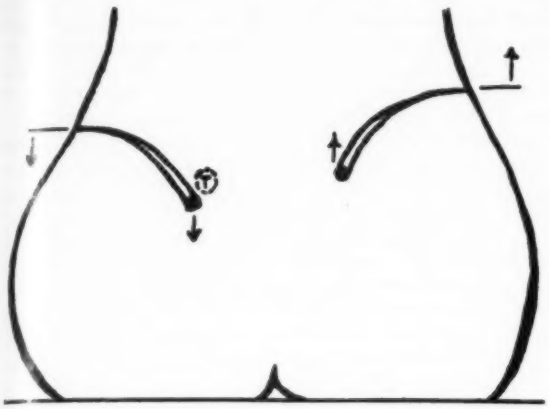

Fig. 3. Diagram to show physical findings in a left rotation sacrolumbar lesion. Sacrum is rotated in a clockwise direction.

affect only one side. Every case examined showed a sacrolumbar rotation lesion on the side of involvement. If the left foot was involved, the sacrum would be found rotated clockwise in relation to the fifth lumbar vertebra. If the right foot was involved, the sacrum was found rotated counterclockwise in relation to the fifth lumbar vertebra. This lesion narrows the intervertebral foramen between the fifth lumbar vertebra and the sacrum on the side of involvement as the superior articular process of the sacrum moves forward (Fig. 2). Irritation of the fifth lumbar nerve due to this lesioning will pass over the lumbosacral trunk, sciatic nerve, tibial nerve, and by way of both the medial and lateral plantar nerves to the digital nerves.[9] This seems to be the "trigger point" producing the symptoms in this syndrome.

DIAGNOSIS

Because of the characteristic history of symptoms together with certain objective findings, there should be no difficulty in the diagnosis of this syndrome. Examination will show some or all of the following:

1. Callus formation on the ball of the foot, under the head of the second metatarsal bone
2. Cavus type of foot
3. Palpatory tenderness under the fourth metatarsal head
4. Pain on flexion of the fourth toe
5. Short or weak first metatarsal segment
6. Productive osteochondral changes at the base of the first metatarsal bone
7. Marked palpatory tenderness on the plantar surface of the foot between the first and second cuneiform bones
8. Palpatory tenderness on the plantar surface of the foot under the inner margin of the cuboid bone
9. Palpatory tenderness at the posterior aspect of the upper extremity of the fibula

The above findings will be more marked on the side involved.

10. Sacrolumbar lesion on the side of involvement. This may be diagnosed by examining the patient in the sitting position. If the lesion is on the left, there will be palpatory tenderness at a point just above and medial to the posterior superior iliac spine on the left. The left posterior superior iliac spine and the left iliac crest will be in a lower position than the right (Fig. 3).

TREATMENT

Treatment of this condition has been as varied as the etiological factors mentioned. Some men advise the use of felt pads placed just behind the head of the fourth metatarsal bone and a metatarsal elastic strap to decrease spreading of the metatarsals. Metatarsal bars have also been advocated. Kohler[10] advocated roentgen therapy to the part. Schuster[2] injected 2 to 3 cc. of 1 per cent Procaine hydrochloride into the dorsum of the foot between the fourth and fifth toes. This is done behind the fourth and fifth metatarsal heads and at an angle of 45 degrees toward the bases of the metatarsal bones. A 26-gauge needle is pushed in until resistance is no longer felt (about half of the length of the needle) and the Procaine injected slowly. This injection is repeated in a week if necessary. Schuster obtained benefit in 80 per cent of patients by this method.

The writer's treatment of this condition takes into consideration all of the points of etiology mentioned. Shoes must be obtained that are wide enough to allow room at the front for the metatarsal heads to bear weight properly, but, at the same time, narrow enough to give a snug fit at the transverse tarsal arch. This can be accomplished by using combination lasts. It is important that the shoe be properly balanced with a rigid shank so placed in the shoe that it will not allow displacement of the cuboid bone. A common fault in some shoes is a raised area on the insole just in front of the heel. In some shoes this is pronounced enough to cause actual upward rotation of the outer side of the cuboid and downward rotation of the inner side. This can be remedied by placing a pad of sufficient thickness (¼ inch) in the heel of the shoe to raise the weight-bearing surface of the heel into a common plane with the base of the fifth metatarsal and the ball of the foot[11] (Fig. 4). The height of heel should be from 1½ to 1¾ inches (in shoe language — from twelve eighths to fourteen eighths). If the Morton syndrome is present, i. e., short or weak first metatarsal segment, the insertion of a piece of felt ⅛ inch thick, ¾ inch wide, and 1½ inches long, placed in the shoe under the head of the

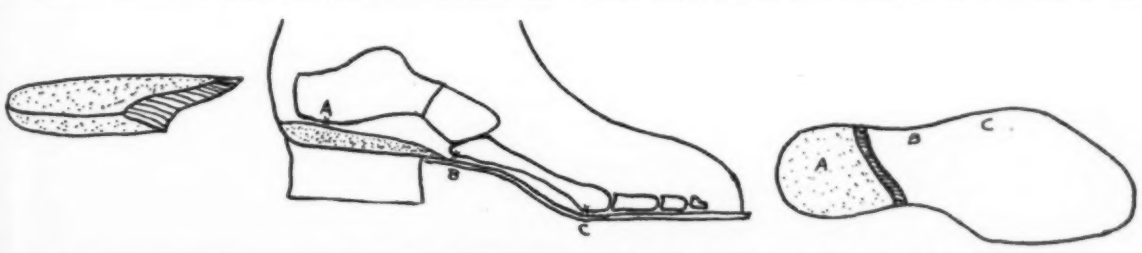

Fig. 4. Diagram showing felt pad used to maintain points A, B, and C in line. (A) tuberosity of the calcaneus, (B) base of the fifth metatarsal, (C) head of the fifth metatarsal.

first metatarsal bone, will help equalize weight bearing across the metatarsal heads.

Contrast baths, placing the feet in hot water for 1½ minutes then plunging them into cold water for ½ minute, repeated four or five times daily, will help relieve congestion and irritation in the foot.

Osteopathic manipulative treatment should include correction of all lesions in the foot, with particular attention to the cuboid and internal cuneiform bones. Any posterior displacement of the proximal end of the fibula should be corrected. A simple method of correction of the sacrolumbar lesion is as follows: Assuming that the lesion is on the left, i. e., palpatory tenderness on the left, the left iliac crest and posterior superior iliac spine lower than the right, have the patient lie on her left side. Stand in front of the patient. Flex the thighs to a right angle with the trunk. Carry the right leg over the side of the table. Rotate the trunk by pulling the left arm and shoulder forward, to produce locking down to and including the fifth lumbar vertebra. Hold the right shoulder back with the right hand. Place the left forearm on the patient's right ilium just above the tuberosity of the right ischium. After locking, a thrust is made with the left arm toward the operator and downward toward the floor. This rotates the sacrum in a counterclockwise direction, realigning it with the fifth lumbar vertebra, and opening up the intervertebral foramen on the left side, relieving irritation of the left fifth lumbar nerve.

If the foregoing corrections are obtained and maintained, the patient will experience almost immediate, complete relief from symptoms. If relief is not obtained, either the technic was not correct, or, because of long-standing irritation, a neuroma has formed and its removal may be necessary.

SUMMARY

A very painful affliction of the foot has been described and a new and osteopathic approach as to its etiology, diagnosis, and treatment has been discussed.

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Management of Injuries of the Hand*

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The hand has too long been neglected, when it should be every physician's concern. All doctors, at one time or another, encounter injuries and abnormalities of the hand. This most useful and most vulnerable member of the human body is subject to a great variety of injuries, which generally are first seen and first cared for by the physician most readily available. Upon this doctor rests the responsibility for the prompt and accurate diagnosis of the injury sustained, and upon his judgment the eventual outcome in a large measure depends. The original management of the situation is the most important single factor in determining whether the injury will speedily heal with early restoration of the maximum usefulness of the hand or whether disabling deformities or complications will be the ultimate result.

Usually minor injuries of the hand, so often neglected by the patient, come under the physician's observation only when the invasive and destructive effects of infection are already well established. We must be trained to deal with these conditions with good practical and scientific judgment and skill. We must be able to recognize at once the extent and seriousness of the trouble, so that we may insure proper treatment.

It is, therefore, not the trained surgeon or the orthopedic specialist, but rather the practicing physician first seeing these conditions who must recognize them and advise or treat the patient with a degree of skill and intelligence.

Treatment of hand injuries has usually been considered a chore to be delegated to the most inexperienced intern in the hospital or to the nurse in the physician's office. The results of such a practice have been generally poor, as might be expected.

I would like to have each of you look at your hand, marvel at its construction, consider all of its usefulness to you, a practicing physician. Then put yourself on the other side of the examining table in the role of an injured patient. He must feed and clothe himself and support his family, just as you and I must. His most important tools for his survival are his hands, just as they are yours and mine. Therefore, let us apply the "golden rule" to the care of injured and infected hands.

We must also use the all-important "golden period" in the proper treatment of hand injuries, especially tendon injuries. We all know about and understand the "golden rule" and its application, but the "golden period" may need some clarification. By this period, I mean the elapsed time from the minute of injury to the hour of surgical repair. The success or failure depends not only on your skill and knowledge, but also upon the speed with which you act to bring about good repair within a certain safe time; hence the "golden period." This is usually considered to be within the first 4 to 6 hours following injury, after

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which each minute of delay makes more probable complications such as infections.

TREATMENT OF FELONS

I shall begin the surgical side of this discussion by considering first the apparently minor puncture wound involving the fleshy pad on the palmar surface of the distal phalanx. Such an injury is usually considered by the patient to be too trivial to report to the doctor. The first encounter with the patient frequently takes place following a sleepless night, because of pain and throbbing in the affected finger. There will be found upon examination some swelling, slight redness, induration, and extreme tenderness at the distal tip. The condition can be differentiated from a paronychia by the absence of unilateral swelling along the margin of the nail and by the severity of the pain. The diagnosis should be by now established as a felon and the patient should *not* be told, as have so many patients in the past, to go home and soak his finger in epsom salts solution until it comes to a head or becomes soft and fluctuant. Here is a condition that requires immediate surgical assistance if the disfiguring after-results that may follow a neglected felon are to be avoided. When the anterior closed space is involved, as evidenced by the signs mentioned above, drainage must be prompt and thorough. General anesthesia may be required. However, I have been successful with the treatment of these cases under nerve block anesthesia placed in the region of the proximal end of the proximal phalanx of the digit.

A lateral incision is made parallel to the shaft of the phalanx and carried straight across the palmar face of the phalanx, deep to the pulp, passing through the anterior closed space. It is best, especially if frank pus is encountered, to incise both sides of the phalanx so that the opening is through and through. If the incision above described is adequately made, there is hardly ever need for connecting the lateral incisions in hockey-stick fashion around the end of the finger. This procedure, making a flap or fishmouth of the finger pulp, is mutilating and usually unnecessary. An incision in the midline does not drain and is disabling and entirely inappropriate. Postoperatively, a rubber drain placed in the incised area for 24 to 48 hours will insure better drainage. Wet dressings, splinting, and chemotherapy complete the care.

Should x-ray study during the course of the treatment disclose an apparent loss of bone density, there is probably no reason for alarm. Recheck pictures made in a week or 2 usually show a complete restoration of bone density following the relief of pressure.

MUTILATING INJURIES OF THE HAND

Mutilating injuries are, unfortunately, not rare. Any type of trauma of a severe nature may result in loss of fingers, part of the hand, or the whole hand. Explosions, crushing injuries, and mangling by saws, presses and other machinery, such as may be encountered in many industries, are responsible for serious structural damage to the hand.

The problems which such injuries present to the surgeon will tax his ingenuity. He will, however, be guided by three principles in his solution of these problems, namely, (1) combating infection, (2) promoting healing, and (3) conserving tissue.

The first principle, combating infection, is concerned with the avoidance of further contamination in the application of the first dressing, the early adequate treatment of the wound, meticulous care and asepsis in the cleansing of the surrounding area and of the wound itself, in careful debridement, and the application of the sulfa crystals.

The second principle is concerned with such measures as may be safely taken for closure and early or late covering of denuded surfaces and with appropriate dressing and aftercare of the wound. This involves protection of the injured tissues, assuring asepsis, immobilization for complete rest by appropriate splinting or traction in the correct position, and the conservation of function and integrity of undamaged structures.

The third principle, that of conservation of tissue, is fundamentally involved in the other two. All tissue in the hand which may be safely retained consistently with the first two principles, should be spared and protected. No tissue should be sacrificed to speed healing for the sole purpose of saving time. In approaching major injuries of the hand, especially in the light of legal compensation of injured workmen, the question often arises as to whether or not it is advisable to hasten recovery and return the patient to his work earlier at the expense of lost tissue. It is held by some surgeons and insurance adjusters that an early return to productive activity is the main deciding factor.

It is my opinion that the possible preservation of efficiency should never be jeopardized for the sake of a shortened convalescence—particularly in a patient whose livelihood, not only at the moment but through all his active years, depends upon the usefulness of his hands. Every part of the hand, every useful fraction of an inch of finger that can be preserved increases the hand's efficiency to a definite degree. It is a short-sighted policy indeed which will save a few days or weeks at the cost of impaired efficiency throughout a workman's life.

TRAUMATIC AMPUTATIONS OF THE FINGERS

The principles just cited should also be the surgeon's guide in his handling of traumatic amputations of the fingers. Such amputations are, almost without exception, compound fractures.

The clean amputation, that is to say, the loss of a portion of the finger by an incising or lacerating wound or by crushing with an edged implement, may be transverse or oblique. The soft parts and bone are cut through with but little, if any splintering of the latter. The treatment in this case is directed primarily toward the conservation of finger length. Cleansing the wound should be followed by thorough cleansing of the surrounding skin and removal of devitalized tissue, skin, bone chips, and foreign matter from the wound. Since in these cases the wound is fully open, infection is not greatly to be dreaded and the use of a strong antiseptic is neither necessary nor desirable. It is a temptation to reamputate the finger by excising more bone, thus making a neat closure with formed flaps of which the palmar is the longer, in order to place the scar on the dorsum. It is better in the interest of conserving finger length that all of the remaining phalanx be left in situ. This practice will frequently preserve a joint which by reamputation would be sacrificed.

The open amputation stump is best protected by a dressing which will not stick to it and which, by preventing constriction to circulation, will permit subsequent outgrowth of granulations in the process of

healing. For this purpose, I suggest the application of ¼ inch adhesive strips placed in such a way as to direct the position and growth of the new tissue. This is covered by a gauze bandage and a finger cage or splint. At subsequent dressings, the adhesive is removed and the stump lightly sponged with peroxide of hydrogen, normal saline solution, or boric acid solution, to cleanse it of exudate. Dried and crusting secretions should be removed. Adhesive is again applied. In a few days granulation will cover the stump, springing from soft parts and from the marrow of the phalanx. As these grow, they are restricted to the contour of the finger by the enveloping adhesive strips. Epithelization occurs concurrently. Within 10 days or 2 weeks, as a rule, the wound will have healed. When healing is completed, the finger will not be shorter, as in the case of reamputation, but actually longer than it was immediately following the amputation injury. It is by no means uncommon to see as much as ¼ inch of finger length gained in this way. When the amputation is through the distal phalanx, the end of the finger is oftentimes practically restored. Painful or sensitive stumps rarely result.

Comparing the results of this method with those of the so-called classical repair or reamputation with beautiful surgery, nice palmar flaps, and dorsal scars, I have noted the following advantages: (1) more rapid healing, (2) conservation of tissue, (3) reduction of postoperative pain, (4) more usable finger, and (5) decreased rateable permanent disability.

The ragged amputation presents greater bone and soft tissue damage than does the injury previously described. As a result of mangling and crushing trauma, there is frayed skin, subcutaneous fat, and tendons, and probably comminuted splintering fracture of the bone.

The principle of its treatment is still conservative. If, after removal of all nonviable material, there is skin and fat enough left to approximate over the end of the bone, this may be done by the insertion of two or three loosely applied interrupted sutures or, again, by the use of adhesive strips. The sutures must close the wound without tension and should be promptly removed if inflammation and suppuration supervene.

It may be necessary in wounds of this type, where considerable bone is exposed and stripped of soft parts, to resort to one of two measures—either amputation of the exposed bone at the level of the remaining tissue and treatment as outlined previously or use of a graft. The graft should be in the form of a double or single pedicle graft from the abdomen and applied at once following debridement.

In both types of amputation you will note that I stress the conservation of tissue.

TREATMENT OF SEVERED TENDONS

Continuing with injuries to the hand, no discussion could be complete without some detailed discussion of tendon severance and its identification, anastomosis, and surgical management. The majority of patients with hand injuries come in immediately following the injury because of the associated pain, bleeding, and dysfunction. All hands must then be studied physiologically to determine the extent of injury. If there is any evidence of injury to the nerves or tendons, the patient should be given priority in treatment and taken at once to the operating room. No attempt should be made to clean or probe the wound in the emergency room after tests have indicated nerve or tendon injury. All further care, including debridement, and suture of tendon and nerves, should be carried out in the operating room.

The patient should be given 1500 units of tetanus antitoxin and the necessary preoperative medication and then be taken to the operating room. There the hand and arm should be carefully prepared by thorough soap and water cleansing. After exposure of the tendon or nerve by adequate incision, being careful to avoid flexion areas, exact anatomic position is striven for. Following its publication, Bunnell's[1] method of using pull-out wire was tried on a series of cases but was found to be disappointing in my hands. I have, therefore, returned to my former method of suture, using fine cotton or silk.

Since the majority of my cases have been relatively clean, there has not been a tendency for wide debridement. Great care has been exercised to preserve as much tissue of the hand as is possible. In those cases where wide debridement seems imperative and where the tendon is severed, I prefer to close the wound without suturing the tendon rather than run the risk of excessive loss of tissue or infection in the tendon repair.

Three types of anesthesia are employed—local infiltration, nerve block, and general. I prefer local infiltration because of the patient's cooperation, but find that a tourniquet applied for hemostasis becomes very painful. Therefore, I have employed a brachial block whenever possible. In cases where relaxation is required, the anesthesia of choice is general and for it I suggest Pentothal sodium.

A tourniquet in the form of a blood pressure cuff, inflated to 250 mm. of mercury, is used to insure a bloodless field. If the operation is prolonged, the pressure should be relieved every 40 to 60 minutes.

Following the operation, the hand is splinted in the position best suited to relax the severed tendon and a pressure dressing is applied. Unless there is a compelling reason to do otherwise, the dressing is not changed for from 10 to 14 days.

No other injury requires more careful adherence to good surgical principles than does the repair of severed flexor tendons. With lacerations in the tendon sheath, it has been my policy to suture only one of the tendons, the profundus, and to remove the sublimus. This is not cut too long so that it attaches to the profundus, or too short, so that it allows hyperextension of the proximal interphalangeal joint. The sheath is left open over the suture. Incisions for obtaining better exposure are made in the sides of the finger in the antero-lateral aspect, avoiding the digital nerves and vessels. A midline incision is never used.

"B" silk has been generally used as suture material; No. 60 cotton has also been used. The type of stitch depends upon the size of the tendon, the location, and the exposure. The substance of the tendon is not injured more than is absolutely necessary. Without doubt, infection is the most common cause of difficulty in tendon repair. The presence of mild infection does not always preclude a good result, but as a rule, it does. Accordingly, exceedingly great care must be exercised to remove as many contaminating organisms from the wound as possible. Careless surgery, excessive trauma, and the use of irritating solutions for cleansing the wounds are factors contributing to fail-

(Continued on page 182)

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CORTISONE AND ACTH

Those who are acquainted with the history of the healing art and who keep in touch with its progress know that from time to time discoveries are made which promise to be revolutionary. Some of these discoveries richly fulfill their promise. Recognition of the cause of puerperal fever and the isolation of insulin are notable examples. Other discoveries fail to survive the rigors of clinical trial. Outstanding examples of failure are the drugs which, literally by the hundreds, have had their day and which are no longer listed in pharmacopeias or appear in them only as a matter of historical interest. Still other developments follow a course that is marked neither by complete success nor complete failure. The sulfonamides would seem to be examples of this last grouping, although their final evaluation is impossible at this time. That they have been lifesaving in many instances has been repeatedly asseverated by many experienced clinicians. However, it is impossible to deny that they produce deleterious and even fatal side effects and reactions. What their ultimate place in medicine will be can be known only when the development of resistances and fastnesses has run its course.

Just now Cortisone, an adrenal cortical hormone, and ACTH, a pituitary adrenocorticotropic hormone, are coming to the attention of the healing professions and the public. The newspapers in metropolitan centers carry almost daily stories of claims made for them, not by the conservative manufacturers, but by reporters who have extracted what information can be had from the few doctors who have used them experimentally on a few hundred patients. Apparently, as is usually the case with new "miracle" drugs, they have been tried out in a few cases of about every type of pathology to which man is heir. The news reports are little short of fantastic. Some of the pathologies and symptoms reported to be favorably influenced by ACTH have heretofore not been classified as resembling each other. A partial catalogue includes asthma, acute rheumatic fever, juvenile rheumatoid arthritis, several other so-called rheumatic diseases, gout, hayfever, "allergies," the delirium of alcoholics, sensitivity to penicillin, nephritis, and nephrosis.

The approach in scientific publications is much more conservative. The two preparations came into prominence in April of this year, when Philip S. Hench and others[1] working at the Mayo Clinic published a preliminary report on the use of Compound E (Cortisone) and ACTH in rheumatoid arthritis. They found that certain clinical and biochemical features of the disease were improved by daily intramuscular injections of either of the substances. Accompanying the report was an announcement that no supplies of Compound E were expected for additional research or for treatment until 1950, at which time supplies would be exceedingly small.

Cortisone is at present being prepared principally from ox bile and the amount available from that source is too small for large-scale experimental treatment. The United States Public Health Service has launched a program to discover new sources and has reason to believe a source may exist in plants of the Strophanthus variety. An expedition has been dispatched to obtain specimens of plants that grow in Africa, Malaya, Liberia, and China. Even after a source of supply has been located, many problems must be solved. Thus it becomes obvious that plentiful supplies of Cortisone will not be available in the near future.

ACTH is derived from the pituitary gland of hogs. Armour and Company are the original source of supply. They are producing the drug on an experimental scale and are not ready to sell it, but have provided a few doctors with experimental supplies. No announcement of any method of synthesis of the product has been made.

From the foregoing it must be realized that a panacea is not immediately at hand. Meanwhile the public suffers in a very real sense because we have not found a way to keep physicians from talking when they are not yet sure of their ground, or news agencies from boosting circulation even at the expense of agonizing anxiety on the part of those who are desperately suffering.

While the problems of supply are being worked out and the necessary experimental work is being done, physicians should not neglect established methods of therapy. Sober judgment indicates the desirability, even though it may be also the necessity, of letting experiments with Cortisone and ACTH go farther before expecting too much. The osteopathic physician should remember that in osteopathic manipulative therapy he has a means of stimulating the natural resistance and reparative processes of the human organism. It should be remembered too that few drugs are without their disadvantages and drawbacks. Already warnings are being issued that symptoms suggesting intol-

1. Hench, P. S., *et al.*: The effect of a hormone of the adrenal cortex (17-hydroxy-11-dehydrocorticosterone: compound E) and of pituitary adrenocorticotropic hormone on rheumatoid arthritis, preliminary report. Proc. Staff Meet., Mayo Clin. 24:181-197, April 13, 1949; abstr., J. Am. Osteop. A. 48:613, July, 1949.

erance have appeared. Undesirable effects attributed to Cortisone include acne, mild hirsutism, amenorrhea, and depression following initial euphoria. ACTH can upset the body's mineral and water balance.

An article reprinted in this issue of THE JOURNAL from *U. S. News and World Report*[2] presents another approach, "Cortisone . . . is opening up a whole new vista for researchers who are looking for ways to deal with diseases of old age—heart disease, kidney ailments, cancer . . . . Researchers foresee that if they can replace or stimulate the natural Cortisone supply—and they have done it—then they should be able to correct other ailments that result from lack of other hormones. They can do it, they hope, either by replacing the supply directly, or by prodding glands to produce a supply."

But why isn't there more study of what is wrong with a human body's own physiological processes when it does not form its own hormones? Someday science will recognize that the body, if normal, maintains its protective functions as part of its everyday physiology, and a study of normal physiology will get us a long way.

R. C. MCCAUGHAN, D.O.

2. Cortisone—Key to old-age cures. J. Am. Osteop. A. 49: ad p. 43, Nov. 1949.

OSTEOPATHIC CHRISTMAS SEALS

For the nineteenth consecutive year Osteopathic Christmas Seals will soon be placed on sale. Since the first seals were issued in 1931 the numbers sold and the proceeds therefrom have shown a most gratifying and constant increase.

The sale of such seals was originally conceived as a means of securing money for the establishment and maintenance of a fund from which loans could be made to worthy students in osteopathic colleges. The Osteopathic Student Loan Fund which thus came into being has served a most useful and important function. By means of its loans many students have been enabled to finish their training and take their places as practicing osteopathic physicians. It is interesting to note, and a tribute to the character of the students to whom loans have been made, that the Student Loan Fund has never sustained a loss on any loan, each obligation having been retired in full.

Of late there have been many demands for an intensified program of osteopathic research. The vital necessity for research is apparent to all but the expense involved has been a deterrent to the expansion of existing facilities.

Recognizing the importance of research to future recognition of the osteopathic profession and knowing the cost of expansion, the Board of Trustees of the American Osteopathic Association, at its meeting in December of 1948, appointed a special committee to investigate the matter. As a result of the findings of this committee, made up of Alexander Levitt, Brooklyn, N.Y., chairman; Donald V. Hampton, Cleveland; and Floyd F. Peckham, Chicago, the House of Delegates and the Board of Trustees at the St. Louis convention last July voted to include research in the Christmas Seal program.

Research workers in the osteopathic colleges and in the laboratories of Dr. Louisa Burns have for some years been receiving substantial financial aid through the Research Fund of the American Osteopathic Association. The Association this year made grants totalling $40,000 from this Fund, but the requests for grants far exceeded that sum. Curtailment of planned research thus became necessary until funds are available.

To provide the needed funds it has been decided to allot 90 per cent of the proceeds from the 1949 sale of Christmas seals to research, leaving 10 per cent with the Student Loan Fund. Through this plan research activities will receive much needed help without jeopardizing the functions of the loan fund program.

It is felt that the expansion of osteopathic research will have many salutary effects. Government grants and gifts from private endowments which are sorely needed will come only when the osteopathic profession itself has provided the initial funds to establish a sound and progressive research program. Research can be a most important factor in the progress of osteopathy, especially where scientific bodies and the public are concerned. Once a concerted and successful program is under way the value of the work can be demonstrated to both government and private sources from which funds for additional equipment and personnel can be obtained.

The success of the sale of Christmas Seals for osteopathic education and research will depend in a great measure upon the members of the profession individually. The committee and the Central office force will do all in their power to wage a vigorous campaign, but they must rely on the members to contribute and to distribute the seals, which in turn suggests contributions. Patients and friends of osteopathy will welcome the opportunity to help. Doctors who are in the habit of buying stamps should double or treble their purchases this year.

The seals come in sheets of one hundred. The four center seals on each sheet bear a likeness of Dr. Andrew Taylor Still.

Seldom have members of the profession had the opportunity to do more to further the true scientific advancement of osteopathy. The purchase of the seals will assure the success of this program and their widespread use on all mailings will be of inestimable value in the field of public relations.

J. R. FORBES, D.O.

SPECIAL ARTICLE

Role of the Osteopathic Lesion in Functional and Organic Renal Pathology

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It is of particular importance in discussing the osteopathic lesion and its relation to a complex organ such as the kidney that a definite order be followed. To understand renal disease one must have a clear picture of renal physiology and the osteopathic concept. For that reason this paper is divided into three sections: (1) The Osteopathic Concept, (2) Renal Physiology, and (3) Relation of the Osteopathic Lesion to Renal Disease.

THE OSTEOPATHIC CONCEPT

Too often we tend to fall into a semantic trap when we speak of the osteopathic lesion. The system of healing and causation of disease, which A. T. Still spent his life studying, cannot be summed up as an osteopathic lesion. The lesion itself is but a part of a concept of disease. Thus it is wiser to speak of the osteopathic concept which contains the following basic premises:

1. The human organism contains within itself the ability to resist and defend itself against noxious influences, to resist or compensate for alterations in equilibria, and to repair itself.

2. The body is a unit, as expressed in the fact that abnormal structure or function in one part exerts abnormal influence on another part.

3. The human organism is subject to anatomic and functional derangements of joints and their supports, presumably because of its incomplete adaptation to the erect stance.

4. These functional and anatomic derangements affect the structure and function of neighboring and distant parts of the body, thus initiating and contributing to pathological influences and processes. This complex of the articular disturbances and associated phenomena has been designated as the osteopathic lesion.[1,2]

5. The lesion may be detected and evaluated through its associated phenomena.

6. The osteopathic lesion is conceived as a most important etiological, exacerbating, and sustaining factor in disease, through the establishment and maintenance of a vicious cycle of neural impulses[2] which cause irritative, inflammatory, and other pathological processes which impair the defense and reparative capacities of the human organism.

7. The lesion may be corrected through the application of osteopathic technic. Correction of the lesion interrupts the vicious cycle and provides more favorable circumstances for the operation of the defensive, reparative, and homeostatic mechanisms of the body.

An osteopathic lesion need not be associated with a gross articular displacement; it is best to call it an articular disturbance. The lesion is detected through the soft tissues surrounding it. As in a spinal lesion, the muscles, tendons, and ligaments on at least one side of the articulation are subjected to and maintained at excessive tension. This condition causes the proprioceptors in the muscles to fire increased numbers of impulses, which I shall call aberrant impulses, into the corresponding segment of the spinal cord via the dorsal root fibers with which they are concerned. The frequency of the impulses fired by those receptors is in proportion to the degree of stretch, and, since these receptors are relatively nonadapting, the barrage is maintained as long as the lesion is present.

Through the synaptic connections of the dorsal root fibers, directly and through internuncial neurons, these aberrant impulses affect, potentially or actually, the excitability of all neurons which have their origins in the corresponding segment of the spinal cord. These include not only the anterior horn cells, but also the cells of the anteromediolateral column, which are the preganglionic neurons of the sympathetic nervous system. They also include the neurons coursing in the spinal tracts. This is especially true of the spinothalamic fibers which conduct pain impulses to the cerebrum. Cole[3] presents evidence that it applies to other tracts terminating in the suprasegmental structures.

The neurons in the segment of the cord associated with the lesion are rendered and maintained hyperexcitable by these aberrant impulses. The efferent neurons in these segments are in a state of subliminal excitation and are easily triggered into activity by relatively few impulses from any source. These additional impulses may be so-called "normal" impulses from sources such as other spinal segments, cerebral cortex, skin, etc. The activity of the efferent neurons is dependent on the inhibitory and excitatory impulses which reach them. The lesion may be likened to a magnifying lens at the efferent neuron. Here the impulses reaching them are focused and magnified to a point where the efferent neurons in the lesioned segment will discharge abnormally intense streams of impulses into the tissues they supply. Thus it can be seen that these tissues will enter an altered state of activity which may become continuous.

In order to show the effect of the efferent neuron impulses I will digress slightly to show the effect of nerve impulses on the individual cell. Cells consist of colloidal systems made up of solutions of protein in water and lipoids which hold electrolytes in labile form.[4,5] Cellular activity consists of chemical and physical change, of a rearrangement of colloids and crystalloids so as to form new aggregates, of changes in osmosis, of alteration in cell permeability, and of changes in electrical charge. Among the stimuli which are normally responsible for such disturbances in physical and chemical equilibrium is nerve irritation of either central or reflex origin or due to the aberrant impulses of an osteopathic lesion. The cellular changes follow chemical and physical laws and take place according to principles governing electrical reactions.[4]

*Awarded first prize of $100.00 in the 1948-49 Academy of Applied Osteopathy Contest open to junior and senior students in the osteopathic colleges. Mr. Zirul is a member of the March 1950 class at the Kansas City College of Osteopathy and Surgery.

Nerve action, regardless of its origin, causes changes in the electrical potential followed by changes in colloidal phases and in the ions in the cells.

From the foregoing discussion it can be seen that every cell in the human organism is under some influence of nervous stimuli; these coupled with the more obvious nerve connections to muscle, blood vessels, and glands of secretion become one of the major controls and coordinators of the body. Segmental changes as a result of an osteopathic lesion thus can cause changes in the contractile states, in blood flow through various organs, in visceral motility, in rates and quality of secretion, et cetera.[1] If the changes in tissue activity as a result of an osteopathic lesion are maintained for a period, then pathological changes occur which in turn become secondary sources of afferent irritation.[3,6,7,8] This sets up a vicious cycle of reflex activity which results in trophic changes that no longer depend on nerve impulses for their activity.[6,9,10]

RENAL PHYSIOLOGY

The formation of urine by the kidneys usually is thought of as primarily an avenue for the disposal of metabolic wastes. Actually this disposal is only one aspect of a general regulatory process, dependent on the adjustment of renal function to chemical need, by means of which the composition of the body fluids is maintained at levels consistent with normal and vigorous cellular activity. Formation of urine is much more a means of chemical homeostasis than a mere process of metabolic plumbing.

Approximately 45 liters of body fluid must be exposed to correction in the kidneys. Since the kidneys are small organs, comprising only 0.5 per cent of the body weight, and must mediate the chemical exchange through altering the content of from 2 to 3 liters of plasma in approximately 5 minutes, it can be seen that the kidneys must receive a blood supply which is disproportionately large in relation to other organs. This requires a very direct and profuse system of arterial, capillary, and venous channels which are under the direct control of the autonomic nervous system.

The kidney receives its sympathetic innervation from the sixth thoracic to the first lumbar segments through the greater, lesser, and least splanchnic nerves to the semilunar ganglion. The postganglionic fibers then form the renal plexus, which surrounds the renal vessels, and into which are interlaced the fibers of the vagus nerve. From this plexus, fibers are traced to the arterioles and glomerular and tubular capillaries. Nerve filaments have been described between the cells of the tubules and Bowman's capsule. Millikin,[11] Cole[3] and Pottenger[12] have shown that the function of the sympathetic supply is essentially vasoconstrictor in character. The parasympathetic supply is through the vagus nerve and its action consists essentially of visceromotor and viscerosensory reflexes[12] which may be demonstrated in diseased conditions of the kidney. Pottenger[12] calls attention to spasm of the lumbar muscles as evidence of these reflexes in inflammatory conditions of the kidney. We know such spasm as one of the evidences of an osteopathic lesion.[13,14,15]

The basic functional unit of the kidney is the nephron for here the formation of urine is begun as the blood enters. Each nephron is composed of a vascular portion, the glomerulus, with its arterioles and an epithelial portion, the tubule. The afferent arteriole, which is one of the branches of the interlobular artery, enters Bowman's capsule, loses its muscle coat and rapidly divides into coiled loops of capillaries that form the glomerular tuft. These capillaries join to become the efferent arteriole which has a smaller lumen than the afferent arteriole. From a mechanical point of view this arrangement is excellent for the outward filtration of blood fluids and substances dissolved in them. Blood from the afferent arteriole is spread over a large area in the glomerular tuft, and then must leave through a vessel with a smaller lumen, the efferent arteriole. The filtrate then enters the epithelial portion through Bowman's capsule which is actually a thinned out expanded portion of the tubule. The energy for filtration is from the head of pressure imparted to the blood by the left ventricle.

The arrangement of the afferent and efferent arterioles on either side of the filtering bed becomes of great importance from the osteopathic standpoint because the regulated constriction in one arteriole and relaxation in the other permits exact adjustments of pressure within the capillaries and of the blood flow through them.[16] The constriction of these arterioles is under the direct control of the autonomic nervous system.[6,11]

The tubule consists of Bowman's capsule and three segments. These segments are the proximal convoluted tubule, the loop of Henle which consists of a thin and thick segment, and the distal convoluted tubule. The tubule ends and all urine formation ceases at the collecting ducts which drain into the renal pelvis. The tubule is surrounded by peritubular capillaries which are branches of the efferent arteriole of the glomerulus. The glomerular filtrate which enters the tubule is essentially extracellular fluid. Here the filtrate is converted into urine by transfer back into the peritubular capillaries of most of the water, glucose, salts, and other vital constituents of the plasma by selective absorption. This is associated with secretion into the tubular fluid of other constituents which appear in the urine. The excretion of penicillin from the plasma through the tubules is an example of the tubular ability to excrete certain substances in the plasma.

One of the principal homeostatic functions of the kidney is its regulation of the electrolyte content and the pH of the body fluids. A normal diet contains an excess of potential acid ions, such as phosphate and sulfate, that must be excreted in the urine if the pH of the body fluids is to be maintained. In disease, great demands are placed on this form of renal function. Sodium is the major cation and chloride and bicarbonate are the principal anions in the glomerular filtrate. Most of their resorption occurs in the tubule. Clinically the most significant aspect of sodium resorption occurs in the distal tubule where the balance between the sodium resorption and the secretion by the tubule cells of ammonium and hydrogen ions in the tubular fluid determines the pH of the urine and thereby regulates the pH of the blood. A tendency to acidosis is countered in the kidney by increased secretion of hydrogen and ammonium ions and since they are exchanged for sodium ions which are reabsorbed largely as bicarbonates, and coupled with chloride loss, the acidosis tends to be corrected. Similarly, in alkalosis, the secretion of these ions is suppressed and the alkaline urine which is formed contains increased amounts of sodium and bicarbonate.

RELATION OF THE OSTEOPATHIC LESION TO RENAL DISEASE

We have seen that the function of the kidney is dependent on its blood supply. The blood supply in its turn is closely controlled by the autonomic nervous system whose impulses are dependent on the structural integrity of the body. Goldblatt and his associates[17] have shown that when the renal arteries of both kidneys of a dog were constricted, a persistent hypertension resulted. Ischemia of the kidney producing a pressor substance, rennin, was considered the cause. The severity of the hypertension varied with the degree the renal blood flow had been curtailed. When the compression was sufficient to cause a severe renal ischemia, renal insufficiency developed. Wilson and Byrom[18] using the same technic on rats demonstrated severe vascular damage, consisting of hyaline and fibrinoid degeneration and necrosis of the walls of the arterioles of the kidneys. These degenerations were noted particularly in the afferent glomerular vessels.

Since we know that the blood supply of the kidney and its glomeruli is controlled by the autonomic nervous system, it can be seen that osteopathic lesions, especially from the sixth thoracic to the first lumbar vertebrae, would cause aberrant impulses to the interlobular and glomerular arterioles. These impulses which are mediated through the sympathetics, cause an increased tonicity of the muscular walls of these arterioles, effectively making the lumen smaller and causing a relative ischemia to the renal parenchyma. Goldblatt[17] and Wilson and Byrom[18] have shown what the results of such an ischemia are. If the aberrant impulses continue for a long period permanent degenerative conditions will result. This helps explain the increased incidence of degenerative renal disease in the older individuals.

According to Still's basic principles the human organism is capable of manufacturing its own defense against disease, including the antibodies of the blood stream. When a relative ischemia of the kidney exists, not only may degenerative conditions result, but the kidney deprived of an adequate blood supply is not protected against toxic invasion. Thus a patient with a streptococcic infection who has lesions of segmental areas innervating the kidney is prone to develop glomerulonephritis, which according to Boyd[19] is usually due to the toxins incident to a streptococcic infection. The same reasoning holds true for any of the other toxic and bacterial diseases of the kidney.

The parasympathetic supply is through the vagus nerve and is vasodilatory in nature. Therefore, lesions affecting the vagus nerve will tend to cause arterial congestion of the kidney. Cole[3,6,20] has shown that lesions of the atlas and seventh cervical vertebra, through their effect on the vagus, caused the arterioles of the kidney to become congested. The glomeruli become swollen and fill Bowman's capsule and there are many red cells between the loops of Henle's system. The picture is that of cloudy swelling.

The blood supply of the kidney has been shown to be dependent on a normal stream of neural impulses. Many pathological conditions may result from an impeded blood supply due to an osteopathic lesion causing aberrant neural impulses, but all renal disease cannot be adequately explained by an impeded blood supply. We know that the kidney tubules do not act as mere mechanical filters. Their function can almost be classed as secretory since the transference of substances through the tubular cells is mediated by the cellular cytoplasm. Nerve tendrils have been demonstrated between the tubular cells and their function is probably the control of these same tubular cells. Here the picture becomes clearer concerning the effect of an osteopathic lesion on the homeostatic mechanisms. The ability of the tubular cells to keep the pH of the blood and body fluids at a constant figure, by varying the excretion of sodium, chlorides, ammonium, phosphates, and sulfates is known, but the control of this function has been in doubt. Some part of this function is obviously mediated through the nervous system as evidenced by the nerve connections. It is, therefore, perfectly feasible that these same nerve connections may transmit aberrant impulses due to an osteopathic lesion and cause a shift in the delicate homeostatic mechanisms.

In all of this discussion diseases of extrarenal origin which cause renal dysfunction have not been mentioned. An example of this is diabetes insipidus, a condition in which large quantities of urine of very low specific gravity and low chloride content are excreted. This condition, rather than being of renal origin, is the result of a disorder affecting the integrity of the hypophyseal-hypothalamic mechanism.[16] It will suffice to say that according to the osteopathic concept, the human organism is a unit and thus each organ is

THIRD ANNUAL PRIZE CONTEST OF ACADEMY OF APPLIED OSTEOPATHY

The Academy of Applied Osteopathy will award cash prizes of $100.00 for first prize, $75.00 for second prize and $50.00 for third prize for the three best papers of not more than 2500 words submitted by any junior or senior student of osteopathy on the following subject:

The Role of the Osteopathic Lesion in Functional and Organic Gastro-Intestinal Pathology.

RULES OF THE CONTEST

1. Any senior or junior student in any recognized osteopathic college may enter the contest.

2. Papers must be not more than 2500 words in length, typewritten, double spaced and on one side of paper only.

3. Three judges will make the awards, giving major consideration to clarity of statement and logical application of osteopathic principles.

4. Three copies must be submitted to the Chairman of the Publication Committee, Thomas L. Northup, D.O., Altamont Court Apts., Morristown, N.J. before March 1, 1950.

interdependent on the other. It is beyond the scope of this paper to discuss the secondary effects to the kidney of diseases of other organs, but these should always be kept in mind.

CONCLUSION

1. It is concluded that the osteopathic lesion, especially of the sixth cervical to the first lumbar spinal segments, causes aberrant neural impulses to the kidneys.

2. These aberrant neural impulses are visualized as one of the major exciting causes of renal disease.

3. By normalizing the structural integrity of the body through the intelligent application of osteopathic manipulative technic, renal disease may be prevented and recovery from existing renal disease may be facilitated.

5333 Swope Pkwy.

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JUDICIAL REVIEW OF ADMINISTRATIVE DECISIONS

In recent months the Supreme Courts of several states have rendered decisions dealing with various questions as they involve the scope of judicial review of administrative decisions. In the case of Jaffee v. State Department of Health, 64 Atl. 2d, 330 (1949) the Supreme Court of Connecticut dealt with some of the problems involved in the revocation of a license to practice medicine and surgery where an appeal was taken from the action of the state medical examining board.

By statute, the State Medical Examining Board of Connecticut is authorized to conduct hearings concerning the suspension or revocation of a license and may make recommendations thereto to the Department of Health which is required to revoke a certificate of a medical practitioner upon the receipt of a recommendation to that effect. The authority of the Board to grant licenses and to conduct hearings relating to the suspension or revocation of such licenses is a lawful delegation of part of the general police powers of the state to protect the health of its people.

In this case the complaint charged that the physician had treated Norman Dombris "in a fraudulent, dishonorable, unprofessional and incompetent manner." It was alleged that the physician had operated on Dombris for a fissure but did not precede the treatment with an enema, had neglected to sterilize a speculum used by him in the operation, had charged one hundred and fifty dollars but ultimately reduced the fee to a hundred and twenty-five dollars which Dombris paid and had led Dombris to believe that the condition had been corrected. Dombris, however, was not benefited by this operation and subsequently consulted another physician and surgeon who informed him that he still had the fissure. Dombris was then taken to a hospital where he was operated upon for a fee of fifty dollars with an additional twelve dollars charge for hospital visits. The second operation was successful and resulted in the eradication of the fissure.

The original complaint was made to the Board by the Commissioner of Health and after due notice and a copy of the complaint had been served upon the physician, a designated time and place was set for the hearing. The notice of charges against the practitioner should state the charges with particularity so that he may be fairly appraised of the nature of the offense with which he is charged. In such hearings the accused may appear in person or be represented by legal counsel if he so desires, and may produce witnesses in his own behalf, and may question witnesses. The Board has a similar right. Generally licensing boards are represented by the office of the Attorney General in such hearings. A hearing having been accorded the defendant, the Board voted to sustain the charge that the defendant had treated Dombris "in a fraudulent, dishonorable, unprofessional and incompetent manner." The Board further recommended to the State Department of Health that the physician's license to practice medicine and surgery be revoked.

Upon the revocation of his license the defendant appealed to the Superior Court which sustained the action of the Board; from this decision the defendant then appealed to the Supreme Court of Errors of Connecticut. The question presented by the appeal was whether the State Medical Examining Board acted properly in determining that the physician's license to practice medicine and surgery should be revoked.

The right to appeal from a decision of a licensing board is usually granted by statute. Generally, in a quasi-judicial hearing the decision of the Board is conclusive upon the merits of the case and the courts in reviewing such a case only inquire into the jurisdiction of the Board, the regularity of the proceedings, and whether there has been an abuse of discre-

tion. In this case the Connecticut Court made the following statement concerning the matter of appeals.

> On an appeal from an administrative board we have repeatedly stated that the function of the court is to determine whether or not it acted illegally; and while we have frequently added the words "arbitrarily or in abuse of its discretion," this manner of expression merely points to certain aspects in which the illegality may subsist because the conduct of the Board would be in violation of the powers granted to and duties imposed upon it. Modeste v. Public Utilities Commission, 97 Conn. 453, 459, 117 A. 494. In the former case it was pointed out that, under the division of powers between the branches of government provided in our constitution, the administrative functions as such cannot be vested in the courts. The revocation of a certificate of registration granted to a physician and surgeon is just as much administrative matter as the original grant of it. Brein v. Connecticut Eclectic Examining Board, 103 Conn. 65, 83, 130 A. 289; Kram v. Public Utilities Commission, 126 Conn. 543, 549, 12 A. 2d 775. Neither directly nor in the guise of an appeal can authority be vested in a court to determine upon its independent judgment the question whether or not a certificate should be revoked; the court can act only in so far as judicial questions are involved; and on appeal it can review administrative action only so far as to determine whether any illegality has entered into it. Where upon an appeal the court hears evidence it is solely for the purpose of determining that question, Colonial Beacon Oil Co. v. Zoning Board of Appeals, supra; even where a statute required that an appeal should be tried de novo, we held that the court should make an independent inquiry into the facts but only for the purpose of exercising that function.

Furthermore, the court will not generally permit additional evidence to be introduced and the court will base its review primarily on the record maintained by the licensing board.

With respect to the recommendations of the Board the court stated as follows:

> In the recommendation to the department of health, the board incorporated a statement that its action "was based upon certain subordinate facts adduced from the testimony at the hearing" and detailed its conclusions as to the conduct of the plaintiff in this way: "Fraudulent treatment" in that he informed or implied to Dombris that he had corrected the diseased condition of the rectum when he had not done so; "dishonorable treatment" in that he had insisted on the payment of an exorbitant fee for services to be considered scarcely more than an office treatment; "unprofessional treatment" in that throughout the treatment he had behaved in a manner not compatible with the established standards of medical professional conduct in this state; and "incompetence" in that his background and training did not justify his claim and statement that he was a specialist in the treatment of diseases of the rectum that he did not precede the treatment with an enema and neglected to sterilize a speculum used by him in the operation, and that he did not perform the relatively simple procedure which was indicated for the relief of the condition in question and which when later followed by a skillful and competent surgeon resulted in its eradication.

When the recommendations of the Board containing these statements were offered in evidence at the trial on appeal, the physician's counsel was overruled in his objection to the introduction of these findings on the ground that it was a matter occurring after the hearing of which he had no knowledge, until it was offered in evidence. All the cases reveal the importance of making a complete and adequate record which may be introduced into evidence in court action on an appeal from the board's decision. With reference to the adequacy of the record the court stated:

> . . . a full and complete statement in the minutes of the board's action, made with such particularity as to enable the court upon appeal to clearly understand what was done, is highly desirable.

The court overruled the objection to the introduction into evidence of the recommendations of the Board, but indicated to the Board that as a matter of proper procedure such conclusions should be stated in its minutes. The court further explained that such recommendations were properly prepared to enable the court to understand the basis for the Board's action, and that the physician involved could have moved for a continuance if unduly surprised by them.

The major basis for appeal, however, was that no evidence was introduced at the hearing to support certain conclusions of the Board, and that the Board reached its conclusions on the basis of its own understanding of the obligations and duties of the defendant as a physician and surgeon. The physician's contentions were that no evidence had been introduced before the Board to prove (1) that the fee charged by the doctor was excessive or that his conduct was not compatible with "the standards of medical professional conduct" in the state, (2) that his claim to be a specialist in the treatment of diseases of the rectum was not warranted by his own testimony, and (3) that he was negligent in not giving an enema before the operation and in not sterilizing the speculum he used. With regard to the necessity of introducing evidence into the record to support the conclusions of an administrative body the Supreme Court of the United States in the Interstate Commerce Commission case, 227 U.S. at page 93 stated:

> The Commission is an administrative body and, even where it acts in a quasi-judicial capacity, is not limited by the strict rules, as to the admissibility of evidence, which prevail in suits between private parties. Interstate Commerce Comm. v. Baird, 194 U.S. 25, 24 S. Ct. 563, 48 L.Ed. 860. But the more liberal the practice in admitting testimony, the more imperative the obligation to preserve the essential rules of evidence by which rights are asserted or defended. In such cases the Commissioners cannot act upon their own information as could jurors in primitive days. All parties must be fully apprised of the evidence submitted or to be considered, and must be given opportunity to cross-examine witnesses, to inspect documents, and to offer evidence in explanation or rebuttal. In no other way can a party maintain its right or make its defense. In no other way can it test the sufficiency of the facts to support the findings; for otherwise, even though it appeared that the order was without evidence, the manifest deficiency could always be explained on the theory that the Commission had before it extraneous, unknown, but presumptively sufficient information to support the finding.

This decision sustains the position of the accused physician and was controlling except that the court distinguished the case on the basis of the facts. The Connecticut Court held that the only evidence which could be offered to substantiate the charges was the opinions of expert witnesses and that these would only serve to enlighten the Board. The determination of the admissibility of expert testimony is generally agreed to be as stated in Taylor v. Town of Monroe, 43 Conn. 36:

> The true test of the admissibility of such testimony is not whether the subject matter is common or uncommon, or whether many persons or few have some knowledge of the matter, but it is whether the witnesses offered as experts have any peculiar knowledge or experience, not common to the world, which renders their opinions founded on such knowledge or experience any aid to the Court or jury in determining the questions at issue.

The court went on to analyze the composition of the Medical Examining Board, who were the triers of the facts, and concluded that since they were all qualified physicians who could decide whether certain conduct of a physician or surgeon so derogated from professional standards as to jeopardize the interest and health of the public. The court held that the Board would not be bound by the opinion of experts and from a practical viewpoint would probably not be affected by such testimony. The court held further that the Board, actually experts themselves on the questions involved, was competent to arrive at conclusions without the use of expert opinions; and that expert testimony was only needed when "an issue presented is such that its solution can only be reached upon the basis of the special knowledge of expert witnesses." However, the court pointed out that the Board must permit the accused to present expert witnesses if he so desires at the Board hearing and that such evidence would also be received by the court on appeal. However, the court firmly emphasized that expert testimony in this case was not necessary.

With regard to the characterization by the Board of the physician's conduct as "fraudulent, dishonorable, unprofessional and incompetent" the court stated that in construing such terms consideration must be given to the legislative intent in enacting the statute. In amplifying on the meaning of these words in Sage-Allen Co. v. Wheeler, 119 Conn. 667, 179 A. 195 the court said:

> The words must have been used in the light of the fundamental purpose of the statutes to regulate the profession in the public interest and they can only be construed as intending to include conduct within their fair purport which either shows that the person guilty of it is intellectually or morally incompetent to practice the profession or has committed an act or acts of a nature likely to jeopardize the interest of the public.

The Board had not held that each ground was independently sufficient for revocation of a license, but relied on the cumulative effect of its conclusions, which necessitated the court's determining that all the material bases for the revocation were not erroneous. Had the Board stated that each ground for revocation was independently sufficient, the court would only have needed to find substantial evidence to support one charge and conclusion as made by the Board.

The court held that the Board had not abused its discretion in recommending revocation of the accused physician's license rather than suspension, and the decision of the lower court was sustained.

The approach of the Connecticut Court to the use of expert testimony before licensing boards may result in substantially diminishing the use of such testimony in revocation cases. Since the courts are usually reluctant to disturb the decisions of an administrative body, unless it is clearly proven that such body acted illegally, substantial authority is vested in the Board by this decision because the record of the Board need not show the bases for the Board's conclusions when expert opinions are the only method of proving such bases. Although in Connecticut the record may be lacking in evidence in this particular, the Board must continue to maintain complete and adequate records to offer in evidence to the courts where an appeal is taken from its decisions. Otherwise, the Board subjects itself to possible reversal because its action may be termed "illegal."

Decisions involving judicial review of actions of administrative agencies are a precedent for the handling of cases appealed to the courts by members of voluntary associations who feel that they have been aggrieved or oppressed by disciplinary action of their association. However, as with other administrative bodies, the courts are reluctant to disturb the decisions made by a voluntary association unless its action is clearly proven arbitrary or an abuse of discretion.

Department of Public Relations

CHESTER D. SWOPE, D.O.
Chairman
Washington, D. C.

BILLS IN CONGRESS

The first session of the 81st Congress ended October 19, 1949. The second session will convene January 3, 1950. Pending bills do not die between sessions. They retain their status and are carried over to the second session.

HR. 4582—Mr. Judd of Minnesota. Increases amount of contribution to World Health Organization.

HR. 4660—Mr. Burnside of West Virginia. National School Health Services Act.

HR. 4725—Mr. Bolling of Missouri. National Child Research Act.

HR. 4738—Mr. Weichel of Ohio. National Multiple Sclerosis Act.

HR. 4749—Mr. Johnston of South Carolina. Removes requirement of residence in District of Columbia for membership on Commission on Mental Health. Passed both Houses.

HR. 4763—Mr. Poulson of California. Amends Hill-Burton Hospital Construction Act to increase State allotments based on population increase.

HR. 4771—Mr. Mitchell of Washington. Raises State minimum allotment under Hill-Burton law from $100,000 to $250,000.

HR. 4784—Mr. Hays of Ohio. National School Health Services Act.

HR. 4799—Dr. Durham of North Carolina. D. C. Pharmacy Permit and Equipment Act.

HR. 4815—Provides for medical services to non-Indians in Indian hospitals. Passed House June 20, 1949. Favorably reported to Senate September 20, 1949.

HR. 4840—Mr. Fogarty of Rhode Island. Provides for a survey of sickness in the United States.

HR. 4841—Mr. Javits of New York. National Child Research Act.

HR. 4845—Mr. Patten of Arizona. Permits shipment by mail of live scorpions for medical research.

HR. 4846—National Science Foundation Act. Favorably reported to House June 14, 1949.

HR. 4874—Mr. Miller of Nebraska. Establishes Medical Care Investigation Commission.

HR. 4918—Mr. Herter of Massachusetts. National Health Act.

HR. 4919—Mr. Javits of New York. National Health Act.

HR. 4920—Mr. Case of New Jersey. National Health Act.

HR. 4921—Mr. Nixon of California. National Health Act.

HR. 5210—Mr. Rankin of Mississippi (by request). Requires Chief Medical Director of Veterans Administration to make available to all veterans entitled to out-patient eye care the services of qualified optometrists.

HR. 5216—Mr. Rankin (by request). Liberalizes retirement benefits for certain persons in Department of Medicine and Surgery of Veterans Administration.

HR. 5234—Mr. Peterson of Florida. National Leprosy Act.

HR. 5284—Mr. Mitchell of Washington. National School Health Services Act.

HR. 5370—Mr. Potter of Michigan. National Services for Disabled Persons Amendments of 1949. Amends Vocational Rehabilitation Act.

HR. 5393—Mr. Fulton of Pennsylvania. National Child Research Act.

HR. 5479—Mr. Rankin (by request). Provides reimbursement of emergency medical expenses incurred by certain veterans.

HR. 5485—Mr. Davis of Georgia. Same as HR. 5370. Amends the Vocational Rehabilitation Act.

HR. 5505—Mr. Priest of Tennessee. Relates to annual and sick leave of Public Health Service officers.

HR. 5567—Mr. Battle of Alabama. National Child Research.

HR. 5577—Mr. Lesinski of Michigan. Same as HR. 5370. Amends Vocational Rehabilitation Act.

HR. 5625—Mr. Chiperfield of Illinois. Provides for cancer conference.

HR. 5669—Mr. Elliott of Alabama. National Science Foundation Act.

HR. 5716—Mr. Priest of Tennessee. Amends Public Health Service Act regarding admission to Public Health hospitals of certain persons committed by State courts.

HR. 5784—Mr. Buchanan of Pennsylvania. Federal Regulation of Legislative Representation Act of 1949.

HR. 5830—Mr. Priest of Tennessee. Amends Public Health Service Act relating to grants to States for State and local health work.

HR. 5835—Mr. Battle of Alabama. Research in child life.

HR. 5852—Mr. Furcolo of Massachusetts. Provides loans to students to continue post-high school education.

HR. 4922—Mr. Morton of Kentucky. National Health Act.

HR. 4923—Mr. Fulton of Pennsylvania. National Health Act.

HR. 4924—Mr. Hale of Maine. National Health Act.

HR. 4925—Mr. Herter of Massachusetts. Amends Internal Revenue Code to allow deduction of subscription charges to certain prepayment health service plans. Similar bills by Messrs. Javits of New York (HR. 4926), Case of New Jersey (HR. 4927), Nixon of California (HR. 4928), Morton of Kentucky (HR. 4929), Fulton of Pennsylvania (HR. 4930), and Hale of Maine (HR. 4931).

HR. 4944—Mr. Angell of Oregon. Increases State allotment under Hill-Burton law on account of population increase.

HR. 4973—Mr. Mitchell of Washington. National Multiple Sclerosis Act.

HR. 4997—Creates Bureau of Accident Prevention in Department of Labor.

H.R. 4999—Mr. Higgan of Minnesota. Requires Veterans Administration to furnish children of certain deceased veterans medical and hospital care.

H.R. 5007—Career Compensation Act for Armed Services, Public Health Service, etc. Public Law 351, approved October 12, 1949.

H.R. 5027—Mr. Auchincloss of New Jersey. Requires premarital examination of all applicants for marriage licenses in the District of Columbia.

H.R. 5046—Biemiller of Wisconsin. Amends Public Health Service Act to create National Institute for Blindness and Eye Diseases.

H.R. 5066—Mr. Allen of California. Amends D. C. law to make permanent and incurable unsoundness of mind a ground for divorce.

H.R. 5073—Mr. Talle of Iowa. National Multiple Sclerosis Act.

H.R. 5087—Mr. Auchincloss of New Jersey. National Health Act.

H.R. 5132—Mr. deGraffenreid of Alabama. Grants additional exemption of $600 for income tax purposes for totally disabled dependents.

H.R. 5162—Mr. Auchincloss of New Jersey. Same as H.R. 4925.

H.R. 5175—Mr. Hoffman of Michigan. Establishes a Department of Welfare.

H.R. 5182—Mr. Hoffman of Michigan. United Medical and Hospital Administration Act. See page 570 JOURNAL OF THE AMERICAN OSTEOPATHIC ASSOCIATION, July, 1949.

H.R. 5865—Mr. Priest of Tenn. Local Public Health Services Act of 1949.

H.R. 5903—Same as S. 614. Amends Hill-Burton law increasing Federal contribution and extending duration of Act.

H.R. 5940—Mr. Biemiller of Wisconsin. Same as S. 1453, with amendment. Medical Education Aid Act in fields of medicine, osteopathy, optometry, dentistry, dental hygiene, public health, and nursing. Favorably reported to House October 11, 1949.

H.R. 6000—Social Security Act Amendments of 1949. Adds medical care to benefits under public assistance programs (old-age assistance, aid to dependent children, aid to the blind, and permanent and totally disabled). Extends coverage of old-age and survivor's insurance to self-employed, with exceptions including doctors of osteopathy. Also extends old-age and survivor's insurance coverage to employees of nonprofit organizations, but such organizations are not taxable except by consent.

H.R. 6022—Increases compensation rates in Department of Medicine and Surgery of Veterans Administration. Public Law 358, approved October 14, 1949.

H.R. 6084. Mr. Fulton of Pennsylvania. Creates Federal Commission on Services for the Physically Handicapped.

H.R. 6150—Mr. Burnside of West Virginia. Extends time for detail of VA employees for training and research.

H.R. 6176—Mr. Rankin (by request). Similar to H.R. 6150.

H.R. 6200—Mr. Battle of Alabama. National Child Research Act.

H.R. 6201 & H.R. 6202—Mr. Battle of Alabama. Maternal and Child Health Act of 1949.

H.R. 6253—Mr. Marcantonio of New York. Creates Poliomyelitis Research Agency.

H.R. 6278—Mr. Abernethy of Mississippi (by request). Makes all cancer and malignant neoplastic diseases reportable in D. C.

H.R. 6324—Mr. Fulton of Pennsylvania. Amends Public Health Service Act relating to the establishment of additional Institutes. Same as S. 2591.

H.R. 6327—Mr. Davis of Tennessee. Liberalizes status of certain pharmacists in Veterans Administration.

H.R. 6428—Mr. Bennett of Florida. Makes retroactive the increased Federal participation in cost of construction of hospitals under Hill-Burton law.

H.J.Res. 228—National Employ the Physically Handicapped Week. P.L. 162, Approved July 11, 1949.

H.J.Res. 268—Mr. Murphy of New York. Provides for World Conference on Cancer.

H.J.Res. 341—Mr. Priest of Tennessee. Establishes National Children's Day.

H.J.Res. 379—Mr. Eberharter of Pennsylvania. Provides for research into health hazards in air pollution.

H.J.Res. 380—Mr. Kelley of Pennsylvania. Same as H.J. Res. 379.

H.Con.Res. 63—Establishes independent bureau for services to the blind.

H.Con.Res. 134—Mrs. Douglas of California. Permits interstate commerce to allow operation of interstate vehicles by amputees if found capable of performing necessary duties without endangering public safety.

H.Res. 298—Considered and agreed to August 12, 1949. Authorizes House Committee to study lobbying activities, including activities of Federal agencies.

S. 614—Amends Hill-Burton law to increase Federal contribution and extend duration of Act. Passed both Houses.

S. 1103—Exempts nonprofit educational bodies from certain proposed raises in postal rates. Favorably reported to Senate, September 30, 1949.

S. 1453—To amend the Public Health Service Act and the Vocational Education Act of 1946 to provide an emergency 5-year program of grants and scholarships for education in the fields of medicine, osteopathy, dentistry, dental hygiene, public health, and nursing professions. Cited as "Emergency Professional Health Training Act of 1949." Passed Senate September 23, 1949. Similar bill, HR. 5940, favorably reported to House October 11, 1949.

S. 1953—Mr. Butler of Nebraska. Provides for medical services to non-Indians in Indian hospitals.

S. 1969—Mr. Flanders of Vermont, for himself and Mr. Ives of New York. Amends income tax law to allow deduction of subscription charges to certain prepayment health service plans.

S. 1970—Mr. Flanders, for himself and Mr. Ives. National Health Act.

S. 2004—Mr. McCarran of Nevada. School Construction Act.

S. 2008—Mr. Thomas of Utah (by request). United Medical and Hospital Administration Act. See page 570, JOURNAL AMERICAN OSTEOPATHIC ASSOCIATION, July 1949.

S. 2025—Mr. Pepper of Florida. Would authorize appointment of doctors of chiropractic in the Department of Medicine and Surgery of the Veterans Administration.

S. 2060—Mr. McCarthy of Wisconsin. Department of Welfare Act, introduced June 13, 1949. Substitute introduced August 5, 1949. Similar to S. 140 of last Congress.

S. 2162—Mr. Long of Louisiana. Amends Social Security Act for aid to the disabled.

S. 2113—Mr. Pepper of Florida. Requires distinctive containers for certain poisonous drugs.

S. 2211—Mr. Pepper of Florida, for himself and Mr. Murray of Montana. Provides for a survey of sickness in the United States.

S. 2228—Venereal Disease Rapid Treatment Center Act. Passed Senate August 27, 1949.

S. 2249—Mr. Hoey of North Carolina. Provides for the appointment of dental specialists in VA. Includes doctors of medicine as medical specialists. Same as HR. 3209.

S. 2272—Mr. Pepper of Florida, for himself and Mr. Aiken of Vermont. Public Health Service Uniform Advisory Council Act.

S. 2273—Mr. Thomas of Utah. Same at HR. 5577. Amends Vocational Rehabilitation Act.

S. 2352—Mr. Pepper of Florida, for himself, Mr. Murray of Montana, and Mr. Aiken of Vermont. Provides for research in child life and for grants to States for maternal and child health and crippled children's services.

S. 2377—Mr. Tydings of Maryland. Provides for additional appointments of Army-Navy nurses.

S. 2380—Provide greater autonomy for Dental Corps in Army and Air Force, corresponding to current status in Navy.

S. 2404—Mr. Chavez of New Mexico for himself and Mr. Anderson of New Mexico. Same as companion bill HR. 5936 by Mr. Miles of New Mexico. Authorizes appropriation for construction, extension, and improvement of a county hos-

pital at Albuquerque, New Mexico, to provide facilities for the treatment of Indians. As introduced and reported by the respective committees of Congress these bills required the hospital to be operated by the county "in accordance with standards acceptable to the American Hospital Association and the American Medical Association." The Senate on October 17, 1949, struck the language "American Hospital Association and the American Medical Association" and inserted in lieu thereof the words "State of New Mexico." Passed both Houses as so amended.

S. 2541—Extends period for which Veterans Administration employees may be detailed for training and research. Passed Senate September 27, 1949.

S. 2584—Authorizes Public Health Service to study and report to Congress on methods for illness inventories. Passed Senate September 27, 1949.

S. 2591—Amends Public Health Service Act to provide for a National Institute on Arthritis, Rheumatism, and Metabolic diseases, and a National Institute on Neurological diseases and Blindness, and other Institutes. Passed Senate September 27, 1949.

S. 2605—Mr. Neely of West Virginia (by request). Makes cancer and malignant neoplastic diseases reportable in D. C.

S. 2642—Mr. Morse of Oregon (by request). Mental Institution Assistance Act.

S. 2692—Mr. Pepper of Florida. Authorizes donations of certain surplus property for public health purposes, including nonprofit medical institutions, hospitals, or similar institutions providing health care, schools, colleges, and universities which have been held exempt from taxation under Section 101(6) of the Internal Revenue Code.

S. 2697—Mr. Pepper of Florida, for himself and Mr. Holland of Florida. Makes retroactive the increased Federal participation in the cost of construction of hospitals under the Hill-Burton law.

S.Con.Res. 17—Calls on Public Health Service to conduct research on familial aspects of chronic illness. Passed Senate July 6, 1949.

S.Res. 147—Mr. Fulbright of Arkansas, for himself, Mr. Taft of Ohio, and Mr. Hunt of Wyoming. Rejects President's Reorganization Plan numbered one for making Federal Security Agency a Department of Welfare. Adopted by vote of 60 to 32, August 16, 1949.

S.Res. 184—Mr. Murray of Montana, for himself, and Mr. Donnell of Missouri. Authorizes and directs Senate subcommittee on health to continue study of health problems and legislative proposals relating thereto and report to Senate not later than March 15, 1950. Considered and agreed to on October 13, 1949.

HILL-BURTON LAW LIBERALIZED AND EXTENDED

PUBLIC LAW 380, 81ST CONGRESS

(S.614)

AN ACT

To amend the Hospital Survey and Construction Act (title VI of the Public Health Service Act), to extend its duration and provide greater financial assistance in the construction of hospitals, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That this Act may be cited as the "Hospital Survey and Construction Amendments of 1949".

EXTENSION OF DURATION AND INCREASE IN AUTHORIZED APPROPRIATIONS

SEC. 2. (a) The first sentence of section 621 of the Public Health Service Act is amended to read as follows: "In order to assist the States in carrying out the purposes of section 601 (b), there is hereby authorized to be appropriated for the fiscal year ending June 30, 1950, and for each of the five succeeding fiscal years, the sum of $150,000,000 for the construction of public and other nonprofit hospitals; and there are further authorized to be appropriated for such construction the sums provided in section 624."

(b) The paragraph "Grants for hospital construction" under the heading "Public Health Service" in the Federal Security Agency Appropriation Act, 1950, is amended by striking out "$75,000,000" and inserting in lieu thereof "$150,000,000."

ADDITIONAL FEDERAL AID IN CONSTRUCTION OF HOSPITALS

SEC. 3. (a) Section 623 of the Public Health Service Act is amended by adding after subsection (d) the following new subsection:

"(e) The State plan may include standards for determination of the Federal share of the cost of projects approved in the State. Such standards shall provide equitably (and, to the extent practicable, on the basis of objective criteria) for variations between projects or classes of projects on the basis of the economic status of areas, relative need as between areas for additional hospital facilities, and other relevant factors. No such standards shall provide for a Federal share of more than 66⅔ per centum or less than 33⅓ per centum of the cost of construction of any project. The Surgeon General shall approve any such standards and any modifications thereof which comply with the provisions of this subsection."

(b) Sections 624 and 625 (b) of such Act are each amended by striking out "33⅓ per centum" and inserting in lieu thereof "the Federal share."

(c) Section 625 (e) of such Act is amended by striking out "33⅓ per centum of the then value of such hospital, as determined by agreement of the parties or by action brought in the district court of the United States for the district in which such hospital is situated" and inserting in lieu thereof the following: "an amount bearing the same ratio to the then value (as determined by agreement of the parties or by action brought in the district court of the United States for the district in which such hospital is situated) of so much of the hospital as constituted an approved project or projects, as the amount of the Federal participation bore to the cost of the construction of such project or projects."

(d) Section 625 of such Act is amended by adding at the end thereof the following new subsection:

"(f) If the Surgeon General finds with respect to an application for a hospital project that—

"(1) the project is for the completion of a hospital the construction of which was commenced prior to the effective date of this subsection and without Federal aid under this title;

"(2) completion of construction is necessary for use of the completed portion as a hospital;

"(3) the State agency has certified that the applicant is unable, by use of all available funds and by exercise of reasonable effort in obtaining additional funds, to pay the non-Federal share (determined without regard to this subsection) of the cost of completing the hospital but will be able to complete construction with the additional Federal aid provided by this subsection;

"(4) the plans and specifications for the entire hospital are in accord with the regulations prescribed pursuant to section 622, or if not in accord with such regulations, meet substantially the objectives of such regulations;

"(5) the application meets all the requirements of subsection (a) of this section except in the respects covered by clauses (3) and (4) hereof and contains assurances applicable to the operation and maintenance of the entire hospital which meet the requirements of such subsection; and

"(6) the unobligated balance of the sum allotted to the State is equal to or greater than the Federal share of the estimated cost of construction of such project plus the additional amount specified below in this subsection;

he shall approve the application. Upon such approval the Federal share of the estimated cost of such project plus an additional amount not to exceed (1) 33⅓ per centum of the necessary cost to the applicant of the construction completed prior to such approval, or (2) the amount certified by the State agency as necessary to complete the construction of the hospital, whichever is less, shall constitute a contractual obligation of the Federal Government, and certifications for payment under subsection (b) of this section shall be on the basis of the Federal share plus such additional amount: *Provided,* That the total amount certified for payment shall not exceed the cost of construction of such project."

ADMINISTRATION OF STATE PLANS

SEC. 4. Section 632 (a) of such Act is amended by inserting after "under section 625," in clause (4) thereof the following: "or (5) that adequate State funds are not being provided annually for the direct administration of the State plan,".

STUDIES AND DEMONSTRATIONS RELATING TO COORDINATED USE OF HOSPITAL FACILITIES

SEC. 5. Part D of title VI of such Act is amended by adding after section 635 the following new section:

"STUDIES AND DEMONSTRATIONS RELATING TO COORDINATED USE OF HOSPITAL FACILITIES

"SEC. 636. In carrying out the purposes of section 301 with respect to hospital facilities, the Surgeon General is authorized to conduct research, experiments, and demonstrations relating to the effective development and utilization of hospital services, facilities, and resources, and, after consultation with the Federal Hospital Council, to make grants-in-aid to States, political subdivisions, universities, hospitals, and other public and private nonprofit institutions or organizations for projects for the conduct of research, experiments, or demonstrations relating to the development, utilization, and coordination of hospital services, facilities, and resources. Any award made under this section for any such project in any fiscal year may include amounts for not to exceed the four succeeding fiscal years, and such amounts for such succeeding fiscal years shall constitute contractual obligations of the Federal Government: *Provided,* That the total expenditures for all such projects may not exceed $1,200,000 in any fiscal year."

PURPOSE OF ACT

SEC. 6. Section 601 of such Act is amended to read as follows:

"SEC. 601. The purpose of this title is—

"(a) to assist the several States to inventory their existing hospitals (as defined in section 631 (e)), to survey the need for construction of hospitals, and to develop programs for con-

struction of such public and other nonprofit hospitals as will, in conjunction with existing facilities, afford the necessary physical facilities for furnishing adequate hospital, clinic, and similar services to all their people;

"(b) to assist in the construction of public and other nonprofit hospitals in accordance with such programs; and

"(c) to authorize the Surgeon General to conduct, and make grants for the conduct of, research, experiments, and demonstrations relating to the effective development and utilization of hospital services, facilities, and resources, and to promote the coordination of such experiments and demonstrations and the useful application of their results."

MINIMUM ALLOTMENT

SEC. 7. Section 624 *of such Act* is amended by striking out "$100,000" and inserting in lieu thereof "$200,000."

FILING OF APPLICATIONS

SEC. 8. Section 625 (a) of such Act is amended to read as follows:

"(a) For each project for construction pursuant to a State plan approved under this part, there shall be submitted to the Surgeon General through the State agency an application by the State or a political subdivision thereof or by a public or other nonprofit agency. If two or more such agencies join in the construction of the project, the application may be filed by one or more of such agencies. Such application shall set forth (1) a description of the site for such project; (2) plans and specifications therefor in accordance with the regulations prescribed by the Surgeon General under section 622 (e); (3) reasonable assurance that title, as defined in section 631 (j), to such site is or will be vested in one or more of the agencies filing the application or in a public or other nonprofit agency which is to operate the hospital; (4) reasonable assurance that adequate financial support will be available for the construction of the project and for its maintenance and operation when completed; (5) reasonable assurance that the rates of pay for laborers and mechanics engaged in construction of the project will be not less than the prevailing local wage rates for similar work as determined in accordance with Public Law 403 of the Seventy-fourth Congress, approved August 30, 1935, as amended; and (6) a certification by the State agency of the Federal share for the project. The Surgeon General shall approve such application if sufficient funds to pay the Federal share of the cost of construction of such project are available from the allotment to the State, and if the Surgeon General finds (A) that the application contains such reasonable assurance as to title, financial support, and payment of prevailing rates of wages; (B) that the plans and specifications are in accord with the regulations prescribed pursuant to section 622; (C) that the application is in conformity with the State plan approved under section 623 and contains an assurance that in the operation of the hospital there will be compliance with the applicable requirements of the State plan and of the regulations prescribed under section 622 (f) regarding the provision of facilities without discrimination on account of race, creed, or color, and for furnishing needed hospital facilities for persons unable to pay therefor, and with State standards for operation and maintenance; and (D) that it has been approved and recommended by the State agency and is entitled to priority over other projects within the State in accordance with the regulations prescribed pursuant to section 622 (d). No application shall be disapproved until the Surgeon General has afforded the State agency an opportunity for a hearing."

DEFINITIONS

SEC. 9. (a) Subsection (g) of section 631 of such Act is amended to read as follows:

"(g) the term 'nonprofit hospital' means any hospital which is owned and operated by one or more nonprofit corporations or associations no part of the net earnings of which inures, or may lawfully inure, to the benefit of any private shareholder or individual;".

(b) Such section is further amended by striking out "and" at the end of paragraph (h), by striking out the period at the end of paragraph (i) and inserting in lieu thereof a semicolon, and by inserting after paragraph (i) the following new paragraphs:

"(j) the term 'title', when used with reference to a site for a project, means a fee simple, or such other estate or interest (including a leasehold on which the rental does not exceed 4 per centum of the value of the land) as the Surgeon General finds sufficient to assure for a period of not less than fifty years undisturbed use and possession for the purposes of construction and operation of the project;

"(k) the term 'Federal share' with respect to any project means the proportion of the cost of construction of such project to be paid by the Federal Government under part C. In the case of any project approved prior to the effective date of this subsection, the Federal share shall be 33⅓ per centum of the cost of construction of such project. In the case of any project approved on or after the effective date of this subsection, the Federal share shall be determined as follows:

"(1) if the State plan, as of the date of approval of the project application, contains standards approved by the Surgeon General pursuant to section 623 (e), the Federal share with respect to such project shall be determined by the State agency in accordance with such standards;

"(2) if the State plan does not contain such standards, the Federal share shall be the amount (not less than 33⅓ per centum and not more than either 66⅔ per centum or the State's allotment percentage, whichever is the lower) established by the State agency for all projects in the State: *Provided*, That prior to the approval of the first project in the State during any fiscal year, the State agency shall give to the Surgeon General written notification of the Federal share established under this paragraph for projects in such State to be approved by the Surgeon General during such fiscal year, and the Federal share for projects in such State approved during such fiscal year shall not be changed after such approval."

EFFECTIVE DATE

SEC. 10. This Act shall take effect upon the date of its enactment. Approved October 25, 1949.

CIVIL DEFENSE PLANNING

On October 5, 1949, the National Security Resources Board asked the Governors of the 48 States to start work on definite programs of civil defense planning. The osteopathic profession will manifest interest in any new organizational developments or proposed legislation at State and Federal levels affecting civil defense planning so that immediate as well as long-range public health interests will be served.

The following pronouncements of the National Security Resources Board are of interest:

EXECUTIVE OFFICE OF THE PRESIDENT
NATIONAL SECURITY RESOURCES BOARD
Washington

Office of the Chairman
My dear Governor:

A number of agencies of the Federal Government are engaged in the various aspects of planning for civil defense in the event of a national emergency. Many of the states are likewise engaged and some have passed, or are considering, legislation which establishes a state civil defense organization and directs local governments to do likewise.

As you may know, the President has directed the National Security Resources Board to serve as the coordinating body in the Federal Government for civil defense planning. In this connection, a primary objective of the Board is to establish basic policies for relationships between agencies of the Federal Government and the states and their political subdivisions. As an initial step in achieving that objective, NSRB Doc. 121 has been developed, copy attached, which sets forth the views of the Board as to the manner in which the Federal Government will deal with State and local governments in civil defense matters. In addition, the document reflects the Board's thinking with respect to certain criteria which states may wish to consider while engaged in civil defense planning activities.

To be timely, realistic and useful, plans for minimizing the effects of wartime enemy attack, and for repairing the damages from attack must call for joint participation of local, State and Federal governments in their implementation. It follows, therefore, that the development of civil defense plans requires the cooperative efforts of Federal, State and local governments on a continuing basis.

The goal of the National Security Resources Board is the development of genuine and effective federal-state-local cooperation to avoid unnecessary waste of manpower, time and money and at the same time to achieve that degree of preparedness which may be required from time to time for our national security.

Sincerely yours,
JOHN R. STEELMAN,
(Acting Chairman)

POLICIES FOR RELATIONSHIPS WITH STATE AND LOCAL GOVERNMENTS IN CIVIL DEFENSE PLANNING

1. The Chairman and staff of the National Security Resources Board will deal directly with state governments, or through state governments with political subdivisions within states.

2. Information or advice released by NSRB will be channeled to states; it is assumed that states will relay the same to their political subdivisions when appropriate.

3. Requests for information or advice received from political subdivisions may be answered directly with copies of the correspondence going to the appropriate state government; however, requests of this nature will be referred to state governments for direct reply as state facilities for processing them are developed.

4. NSRB will look to various agencies of the Federal Government for the development of civil defense plans and preparedness measures. When understandings are reached regarding assignments of this nature, state governments will be notified. Where other Federal agencies are involved in civil defense planning assignments which require the maintenance of channels of communication with states and local governments, they will be guided by the policies outlined in paragraphs 1, 2 and 3 above.

5. NSRB will maintain contact with national organizations in the field of state and local government on civil defense planning matters for the purpose of:

a. Securing from them current statistical data and other types of general information; and
b. Keeping them informed of civil defense activities of the Federal Government.

6. The NSRB will encourage states to adopt civil defense legislation which:

a. Creates a state civil defense planning body;

b. Provides for civil defense planning bodies in its political subdivisions;
c. Charges the state officials and subordinate planning bodies with responsibility for both peacetime and wartime disaster relief planning and preparedness measures.

7. Although the report of the Office of Civil Defense Planning entitled "Civil Defense for National Security," known as the "Hopley Report," has not been officially adopted, the NSRB believes the report to be a useful guide to the substantive areas in which planning must be done for federal, state and local civil defense.

8. The Federal Government is not prepared at this time to furnish to State and local governments all of the information and guidance needed by them from federal sources to prepare well-integrated and timely civil defense plans for state and local use in emergency. While the agencies of the Federal Government are working toward the fulfilment of these needs, the NSRB will encourage state and local governments to proceed as far as practicable with their civil defense planning. In the process of this planning, it would appear advantageous in the immediate future for the State and local governments to place major emphasis on plans for relief from the effects of peacetime disasters. The experience gained in dealing with peacetime disaster, if carefully evaluated, can constitute a realistic frame of reference against which wartime civil disaster can be appraised.

9. The NSRB, directly or through other Federal agency channels, will transmit to states:
a. Information on activities in other states.
b. Information on activities of Federal agencies.
c. Policy guidance and planning criteria.

10. The NSRB and other Federal agencies will solicit from states current information as to progress in state and local civil defense planning.

COMMITTEE ON SPECIAL MEMBERSHIP EFFORT

STEPHEN B. GIBBS, D.O.
Chairman
Coral Gables, Florida

MEMBERSHIP REPORT AS OF OCTOBER 1, 1949

Membership count, September 1, 1949	7,787
Applications received in September, 1949	43
Graduates licensed in September, 1949	9
	52
Deaths and Resignations in September, 1949	5
Gain in September, 1949	47
Membership count, October 1, 1949	7,834

HONOR ROLL

Walter S. Atkin
D. J. Aveni
J. B. Donley
H. M. Dubin
Munroe H. Kneeland
Dorothy J. Marsh
R. D. McCullough
N. H. Murphy
E. M. Sparling

Current Medical Literature

HYPERTENSIVE ENCEPHALOPATHY AND CEREBRAL ARTERIOSCLEROSIS

Henry I. Russek, M.D., and Burton L. Zohman, M.D., conducted studies of the immediate effects of reduction of blood pressure on hypertensive encephalopathy associated with cerebral arteriosclerosis, which they report in the *New York State Journal of Medicine*, June 15, 1949. Blood pressure of four hypertensive patients was reduced by continuous caudal anesthesia. These patients demonstrated evidence of extensive cerebral vascular disease with generalized arteriosclerosis, arteriosclerotic retinopathy, previous cerebral thrombosis. Their ages were 56, 58, 62, and 67. In these cases the attacks were not improved. There was some evidence of aggravation.

If a diagnosis of hypertensive encephalopathy is made, the additional features of hypertension and frequent cerebral edema must coexist with cerebral arteriosclerosis. If sympathectomy, rice diet, phlebotomy, or other means of reducing blood pressure are used in the hypertensive patient who also shows advanced cerebral arteriosclerosis, the anastomotic circulation in the brain may be impaired even to the point of failure. In the cases presented by Russek and Zohman extensive cerebral arteriosclerosis with impaired cerebral circulation aggravated by angiospasm appeared responsible for the symptomatology.

The authors have achieved marked success with these patients in the administration of large oral doses, as high as 18 grains per day, of papaverine hydrochloride in the control of the symptoms of vascular encephalopathy, whether hypertensive or arteriosclerotic. It is their belief that reduction of blood pressure is contraindicated, since papaverine reduces the frequency and severity of encephalopathic episodes even in malignant hypertension with cerebral edema.

FOLIC ACID AND THE NEUROLOGIC MANIFESTATIONS OF PERNICIOUS ANEMIA

Sufficient time has elapsed since the institution of the use of folic acid in macrocytic anemias with megaloblastic hyperplasia of the bone marrow to evaluate its effectiveness. Willis M. Fowler, M.D., and Atlee B. Hendricks, M.D., trace the conflicting opinions concerning maintenance of adequate blood levels and control of neurologic manifestations in the *American Practitioner* for June, 1949, in which they also present four cases of their own treated with folic acid for pernicious anemia who demonstrated rapid progression of subacute combined degeneration of the cord.

In their first patient on 15 mg. folic acid daily, control of the blood picture was established for a few weeks, followed by complete sudden collapse of both hematologic and neurologic normal standards. Liver therapy was effective in restoring the patient in a surprisingly short time. In the second case, the blood picture was corrected by folic acid to normal values, but neurologic symptoms revealed that folic acid therapy was inadequate protection against progressive degeneration, if it had not actually precipitated the condition. The third patient was being treated with a combination of folic acid and oral liver extract when the severe neurologic regression suddenly occurred. In these cases the neurologic aspects of the disease were reversed by parenteral liver therapy. Significant residual neurologic changes remained in the fourth patient after the change of combined oral liver extract and folic acid to parenteral liver therapy.

Treatment of pernicious anemia by folic acid alone does not protect against and apparently may accentuate neurologic complications in certain cases. With unsupported use of folic acid, normal hematologic values have not always been maintained. In the presence of normal hemoglobin and erythrocyte values subacute combined degeneration of the cord has been known to occur. Neurologic complications in some cases have progressed in spite of the use of oral liver extract combined with folic acid. This combination in some cases has reversed the neurologic regression.

THE PSYCHOSOMATIC STATUS— GASTRODUODENAL ULCER AND VAGOTOMY

Gastric hyperacidity and hypersecretion and psychosomatic status affect the stomach through the vagus nerves to produce ulcer. Recently gastroduodenal ulcer has been treated operatively. Either vagotomy or vagus neurectomy is performed to cut the nervous pathways connecting the patient's adaptive reactions from the brain to the stomach. Abraham O. Wilensky, M.D., states in the *New York State Journal of Medicine*, June 1, 1949, that trial must be continued and observation prolonged before any judgment can be made of the success of the treatment as a temporary or permanent measure for the alleviation or cure of duodenal ulcer. The potential dangers of vagotomy or vagus resection, which are different operations, and the question of ultimate regeneration of the nerves have still to be judged.

Bilateral complete vagus resection is credited with relieving ulcer pain immediately followed by healing of the ulcer,

(Continued on page 182)